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SEPTEMBER 3, 1887.

THE AMERICAN ARCHITECT AND BUILDING NEWS

VOL. XXII. REGULAR EDITION NO. 610.

ARCHITECTURE

ENGINEERING

DECORATION

CONSTRUCTION

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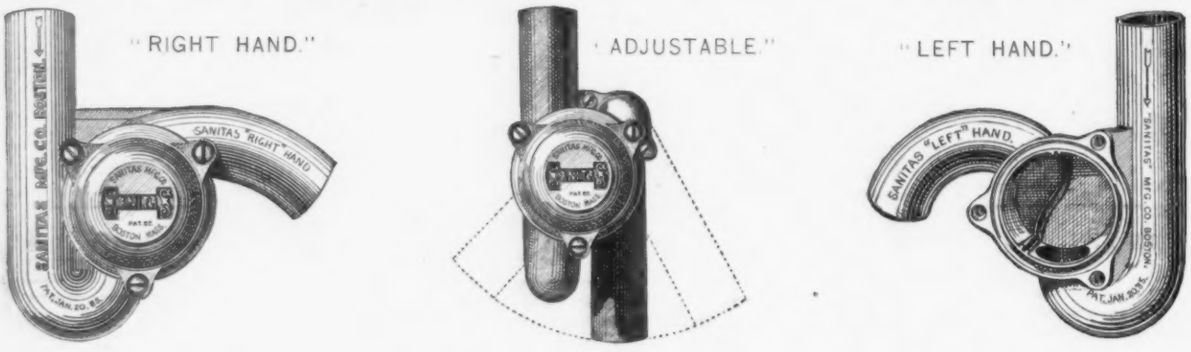
CONTENTS.

Editorial Summary.
Early Settler Memorials.—XII.
Hints for Builders.—IV.
American Marbles.
Societies.—Prix de Reconnaissance des Architectes Americains.
Communications.
Notes and Clippings.
Trade Surveys.

ILLUSTRATIONS.

The Lincoln Building, Boston.
[Issued only with the Imperial Edition.]
St. Peter's Church, Morristown, N. J.
Bank Building, Providence, R. I.
The Pratt Institute, Brooklyn, N. Y.
Church at Cunault, France.

THE SANITAS TRAP.



SOME FACTS AND SOME FANCIES
ABOUT THE SANITAS TRAP.

I. It is sometimes asserted that the seal of the Sanitas Trap can never be broken under any conditions. This is erroneous. Its seal can be pumped out by a force-pump, or by *Laboratory plumbing apparatus*, especially devised to destroy the seals of traps by siphonage. But the seal of the unvented Sanitas Trap *never can be and never has been destroyed by siphonage in good plumbing work*. Furthermore, the unvented Sanitas Trap will stand a severer test of siphoning action than will the vented S-trap. This has been demonstrated over and over again, and the demonstration can be repeated at any time to the satisfaction of any who are interested, provided care be taken to vent the S-trap in a manner *which is practical in plumbing*, using a vent-pipe of the size, length, and average number of bends found in ordinary practice. The seal of the Sanitas Trap will be *lowered* by severe siphoning action, *but it cannot be broken*. II. Again it is sometimes asserted that the Sanitas Trap cannot be clogged. This is also erroneous. The trap can be clogged by matches or kitchen refuse, if improperly used, just as can any ordinary waste-pipe; but when properly set and used the Sanitas Trap will never become clogged to the point of losing its effectiveness. If improperly used, as when under kitchen sinks the cook takes out the sink-strainer and sweeps into the trap bones and refuse never intended for the waste-pipe, the Sanitas Trap will be fouled; but it then *has the great advantage over all others of providing the easiest and safest means of removing this refuse matter*, and that with the aid of an ordinary screw-driver. When used under sinks the trap should be placed close to the sink outlet, and the sink strainer should never be removed. The grease will then pass through the trap in a liquid state and be caught in the suitable grease receptacle beyond. The efficiency of the Sanitas Trap will then remain intact indefinitely, while other traps, like the old-fashoned "D" trap, or its modern representatives, the "Bottle," "Round," and "Pot" traps, have bodies so much larger than their inlet and outlet arms, that they obviously cannot be scoured by the water when it passes through them. III. It is often thought that where special trap vent-pipes are called for, the Sanitas Trap is not needed. Precisely the opposite is the fact. All sanitarians now admit that whether the trap vent-pipe be used or not, *the trap itself should be anti-siphonic*, since the vent alone cannot always be relied upon. The mouth of the vent-pipe is often clogged, under sinks, by grease, since it is never scoured, and the friction due to its bends, and to the disproportion between its capacity and its length, often destroys its efficiency as an air supply. The Sanitas Trap is so constructed that its seal cannot be injured by evaporation produced by trap venting. Therefore, *where trap-vent pipes are called for the use of the Sanitas Trap is particularly necessary*. In virtue of the peculiar construction of the Sanitas Trap, *its outlet-pipe forms its own vent-pipe*, which is infinitely better than a special vent-pipe, inasmuch as it is always kept open by the scouring action of its own discharges. But even if it should ever become closed by grease, no harm could come in this case, since the same closure would not only shut off sewer-gas and siphonage, but also at once announce itself and be removed. IV. Finally, the seal of this trap can never be destroyed by *back-pressure*, in properly arranged plumbing. For with the main soil-pipe vented as it should be, no back-pressure can be generated strong enough to do mischief, where ordinary care and intelligence are used in originally laying out the work. For further explanations on this matter see the circulars and other publications of the

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CONTENTS.

SUMMARY: —
The Prix de Reconnaissance des Architectes Américains. — A successful Suit against the Landlord of an insanitary House. — Public Sewers built by Private Individuals.—The Sewerage System at Asbury Park, N. J. — Suggestions as to the new British Coinage.—The Reclamation of Desert Sand in North Africa. 105
EARLY SETTLER MEMORIALS. — XII. 107
HINTS FOR BUILDERS. — IV. 110
THE ILLUSTRATIONS: —
The Lincoln Building, Boston, Mass. — St. Peter's Church, Morristown, N. J. — Old Providence Bank Building, Providence, R. I.—The Pratt Institute, Brooklyn, N. Y.— Hôtel de Ville, Amboise, France. 112
AMERICAN MARBLES. 112
PRIX DE RECONNAISSANCE DES ARCHITECTS AMERICAINS. . . . 113
SOCIETIES. 115
COMMUNICATIONS: —
The Indiana Soldiers' and Sailors' Monument. — Rector Pierson's Grave. 115
NOTES AND CLIPPINGS. 116
TRADE SURVEYS. 116

IN another part of this issue will be found the essential details of a most praiseworthy and fairly successful effort to give becoming expression to the sense of gratitude and good-will that a large number of the younger American architects have always privately entertained towards the French Government, but until now have lacked the means and opportunity to give it proper expression. The generosity of the French Government in throwing open to foreigners its, in many ways, unexcelled technical and art schools has few parallels abroad, and none, we believe, in this country, and it was fully time that Americans, who, in greater numbers than any other nation, take advantage of the opportunities thus offered, should take some step, not to balance the account—that would be indeed difficult — but to give an outward evidence of their deep sense of obligation. Many will be inclined to look on this movement merely as a stroke of policy, an effort to "hedge" against the possibility that the French authorities might see fit to deny to Americans the accustomed privileges in retaliation for the stupid embargo that our own Government has thought fit to impose through its atrocious tariff on works of art. We know, however, that the Prix de Reconnaissance des Architectes Américains is purely what its name declares, an expression — in its present state somewhat inadequate — of gratitude. The feeling for their French comrades that Americans bring away from Paris is a very strong and vital one, and there must be few indeed who have experienced the kindness, the self-sacrificing helpfulness and contagious enthusiasm of the French pupils in a Paris atelier that do not hope at some time to revisit the scenes of their former studies, and do not feel sure that it will be an easy matter to pick up the dropped threads of friendship. The spirit of the French atelier is one of *bonne camaraderie*, and it is in that spirit that the American architects make their gift.

THE *Sanitary Record* tells a story of a tenant's experiences with a badly-drained house, which conveys some valuable suggestions. Unfortunately, the course of judicial decisions of late has been rather in the direction of restricting the right of tenants to compel landlords to keep the plumbing of their houses in good order. It is quite possible that the disposition of dishonest persons to evade payment of their rent by complaining of the drainage may have made it necessary for the courts to make sure that a good case was established before granting relief; but, however this may be, any one who wishes to compel his landlord to offset sewer-gas against rent must now make it plain that the sewer-gas is present in extraordinary quantities. On the whole, the tenants who have taken the law into their own hands seem to fare the best. One family in New York, which immediately moved out of the premises it had taken on a lease, on finding the rooms smelling of drainage, successfully resisted the attempt of the landlord to enforce his lease, and in the *Sanitary Record's* case, a tenant, after in vain asking his landlord to have the plumbing put in order, had it thoroughly done at his own expense, and then claimed the amount from the landlord, who was obliged to pay it with costs. The house was in a very fashionable quarter of London, surrounded by aristocratic mansions, and was represented by its owner to be in excellent sanitary condition, "in fact, the sweetest house in London." The idea of living in such a sanitary paradise seems to have pleased the tenant greatly, but he was still prudent enough to have the inspector for the district examine the house. This official, whose idea of his duties reminds one strongly of those which obtain in some of our cities, reported that the house was "in fair sanitary condition," but advised some trifling changes. The landlord said he would make these changes, assuring his tenant that as long as he lived in the house he should never have any trouble about the drains. Whether he really made the alterations does not appear, but the tenant seems to have put such faith in his assurances as to suppose that he did, and wrote him a note, in which he said that he was "satisfied with everything," and that the work promised had been carried out to his satisfaction. On moving in, however, the tenant found that the "sweetest house in London" was not all that it should be. On the contrary, it was afflicted with vile smells, and he began to have doubts of its salubrity. He called the attention of the landlord to the odors, but could get nothing done to remedy them. Finally, he concluded to call in the aid of that excellent organization, the London and Suburban Sanitary Survey Association, and paid it a fee of some twenty-two dollars for a disinterested examination of the house. The inspector of the Association found that this "sweet" house was furnished with a huge brick drain, leaky, and partially choked with putrescent deposit, into which discharged, from the upper stories, two "filthy, worn-out and defective" water-closets, with traps corroded into holes, while another water-closet of similar description and used by the servants, was connected directly to the drinking-water cistern. The report of these interesting discoveries was sent to the landlord, who, in fact, was present at the inspection, but he only contented himself with loud assertions that the drain was "a beautiful one and in perfect order," while he explained the presence of three or four inches of black sediment in it by saying that the inspector and his men had got coal-dust and sand into it by flushing out the cisterns. The water-closets he admitted to be old-fashioned, but said that they were perfectly good, and insisted that no repairs or alterations were necessary. The tenant then, finding that his landlord would do nothing, moved out of the house, and had a new drain laid, and the rest of the work put in tolerable order, at a cost of something over a hundred dollars, and sent the bill, together with that for the rent of the rooms in which he lived while his house was being put in order, and the inspector's bill, to the landlord. The whole amounted to about a hundred and seventy dollars, and, on the landlord's refusal to pay, he sued him for it. One would think that he ought to have collected the whole amount, but there seem to have been circumstances which inclined the judge to be lenient, and he directed a verdict for the plaintiff for one hundred and twenty-five dollars and costs.

THE *Sanitary News* mentions two cases in which systems of town sewerage have been constructed as private enterprises, to the great advantage of the citizens, and, we hope, to the profit of the projector. Hundreds of towns and villages have been furnished with a pure water-supply in this way, either through the foresight and courage of a single person, as in the case of Newport, which owes a debt to Mr. Norman that cannot easily be repaid, or by the association of a few individuals, as is now very common; and there is no reason whatever, that we can see, why sewerage works should not be built and maintained on the same principle. At Asbury Park, N. J., which may be taken as the best example at present existing, Mr. James A. Bradley has laid at his own expense more than thirteen miles of pipe sewers, on the separate system, varying from eight to twelve inches in diameter. The sewers are properly ventilated, and a rental is charged for house-connections, the rent ranging from ten dollars per year upward. When this admirable work was undertaken, Asbury Park was a village, entirely unable to bear the expense of sewers, but the fact of their construction, by other means, brought the town at once into notice, and attracted population so rapidly that it is

now quite rich enough to build or buy sewers for itself. Nevertheless, although Mr. Bradley has been so liberal as to offer to transfer the property at an appraised valuation, the citizens are so well satisfied with the management of the sewers, and the price they pay for the service, that they show no disposition to acquire possession of them.

ONE is hardly likely to observe at the first glance all the advantages of such an arrangement. To look at it from the tax-payer's point of view, private ownership of the sewers, with a moderate rental for the use of them, is greatly to be preferred in a small and growing town to the assumption of a heavy burden of public debt. Every one knows that nothing frightens away would-be citizens more effectually from a young town than a large debt. A man who buys an estate in a place with a debt, finds his land already mortgaged, under the law, to pay that debt; and, worse still, he knows, if he is experienced in the ways of assessors, that he will be heavily taxed, false valuations put on property to conceal the exorbitant rate of taxation, and the value of his estate seriously injured as much by the unreliable valuations as by the encumbrance. Of course, the sewers built with the borrowed money render the houses in the town more desirable, and increase their value, but they do very little, if anything, to increase the value of unimproved land, for the reason that the holder of an unimproved estate, who wishes to build upon it, is generally assessed an enormous price for bringing the sewers to his property, in addition to the burden of debt and taxation which his land already shares with the other estates in the town. Moreover, as the main sewers for a town of ten thousand inhabitants are usually made large enough for a future population of twenty thousand, the town of ten thousand people must mortgage its property, and tax its citizens, to carry a load proportioned to a corporate body of twice its size, and those who wish to become inhabitants naturally take alarm at the aspect of the burden which they must help to support. By the commission of the first great outlay to private enterprise all this is changed, and all the advantages of sewerage are secured without the assumption of a public burden. Let any one imagine himself a young man, with a few thousand dollars, looking for a place to make himself a home. At A. he finds a town, like Elizabeth, N. J., and several others in various States, which has brought itself to bankruptcy by borrowing money for public improvements. Taxes have increased until they can no longer be collected, the larger real-estate owners are vainly endeavoring to sell their property at a fraction of its cost; and the bond-holders, under the decision that a town debt constitutes a first mortgage on all the real-estate within its territory, are clamoring at the gates with foreclosure papers. It is hardly necessary to say that he feels no disposition to risk his money here, and passes on to the enterprising village of B. Here the taxes are nominally low, but, if he is shrewd enough to compare the valuations with the rents, or actual sales, are really high: a large water-debt has been assumed, and a small, compact body of men are persistently urging through the town-meetings the creation of another, and much larger debt for the introduction of a sewerage system. No one can tell just what the debt will be, and our prudent young friend makes one more trial. At C. he finds water introduced, and sewers already built, but, on inquiring the cost, and the proportion of the town debt to the valuation, he is told that there is no debt, and that both water-works and the sewers are private property; that, if he buys land and builds, pipes will, if necessary, be extended to his house without cost to him, or assessment on his property, and that he may either dispose of the drainage from his house on his own land, or may have the privilege of discharging it into the sewer for an annual payment of about what it would cost him to pump out a cesspool. It is hardly conceivable that our sensible young man would not hasten to forthwith look out for the best available lot in this fortunate town, and he would find plenty of others there on the same errand. He is considered now a very poor man who cannot, or will not, pay six or eight dollars a year for a supply of water to a single sink, and sewer drainage, independent of its immense advantage in healthfulness, would, at Mr. Bradley's rates, be an actual economy. There is, of course, no reason why the public authority should not charge rent for sewer service, as well as for water-supply, and the interest and the sinking fund for a sewer debt might thus be provided for as effectually as water debts now are; but the combination of surface with house-drainage probably complicates the matter, while public work is notoriously worse done, and worse looked after, at greater cost, than private work of the same kind. Evidently, the charges for sewer privileges, under such circumstances, ought to be large enough to pay good interest on the money invested in the system, to attract capital, which, however, they may easily be without exceeding the annual cost of the filthy cesspool and vault; and as a further inducement to private persons to undertake the work, the public authority would often be of service in securing an outfall by the exercise of the right of eminent domain in behalf of the enterprise, as well, perhaps, as in the enforcement of sanitary regulations made practicable by the provision of sewers. For example, we believe that a town ordinance at Asbury Park now forbids the use of a leaching cesspool within the municipal limits. Of course, the ordinance, although it does not prohibit, as we understand, tight cesspools, or subsoil irrigation, practically urges citizens to make use of the new sewers; but there can be no question that the public authority has the right to do so; and if boards of health are entitled to order wells filled up, as they often do in places with public water-supply, they have much more right to compel the abandonment of cesspools and vaults, which threaten the lives, not only of their owners, but of their neighbors.

A GOOD suggestion is made in the *British Architect* about the new English coinage, which would apply equally well to that of other nations. An attempt has been made to introduce a feebly decimal character into the British currency by reviving the florin, or two-shilling piece, which, it will be observed, is one-tenth of a pound, and new designs have been made for the coin, as well as for the double florin, which is to be issued with it. The designs so far tried are condemned pretty unanimously as ugly, and there has been a good deal of discussion as to the way to go to work to get better ones. One authority proposes a competition, to be confined to the official art schools, while another wishes to have a limited competition among the best sculptors of the day. The *British Architect* improves upon this by proposing to admit decorative artists, as well as sculptors, to the contest; and we hope that this idea will be acted upon. There is no reason why the coinage of a country should not be made not only a credit to its artistic knowledge but an admirable means of educating the taste of the people; yet, with few exceptions, the coins of modern civilized nations are designed with a meagreness of idea, an ugliness of modelling, and an ignorance of the first principles of filling a given space agreeably, for which there is no excuse. Directors of mints, occasionally, when they hear some one laughing at the contrast between a Greek and a modern coin, explain it by saying that our coins would wear too rapidly if they were made with the high relief of the ancient ones; but this is a very poor apology. Some of the small Belgian coins, which are, perhaps, the prettiest of all the modern examples, have a vigorous effect given them, not by raising the effigy in the centre much above the general surface, but by surrounding it with a sunk space, from which it stands out bold and round, although protected from wear by the rim which carries the inscription. With the English or American coins, in which a profile head or other figure swims about in an ocean of background, such a treatment would be impracticable; but the Belgian designers fit their lion very cleverly into his circular frame, without either crowding or awkward vacancies. A disposition of this sort would be the very one which would first occur to a trained decorative artist, to whom the jumbles that now pass muster for coinage designs would be abominations; and a sculptor of the first rank might then be called in with great advantage to complete the modelling.

THE reclamation from the desert, of portions of Northern Africa by means of artesian wells, seems to be going on prosperously. The first well has constantly increased its flow, and now irrigates an area of fifteen hundred acres, on which are growing many thousand palm trees, besides garden crops for the support of the population which has flocked to the place, and a second well has been driven, about two miles from the first, which already delivers nearly twice as much water as the first. If the flow from the second can be distributed as successfully as that from the first, the two wells, neither of which is three hundred feet deep, will bring into cultivation an area of more than seven square miles, forming an oasis of considerable importance, and it seems now probable that the French Government may take measures for restoring their ancient fertility to tracts which were once renowned for their fruitfulness.

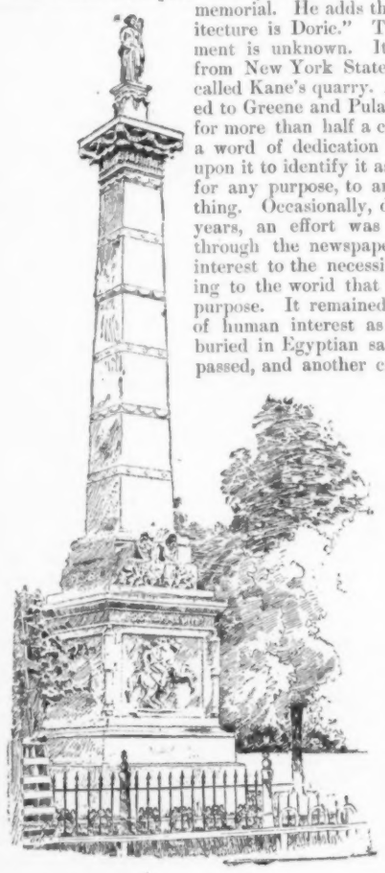
EARLY SETTLER MEMORIALS.[1]—XII.

THE GENERAL GREENE MONUMENT.

GREENE MONUMENT SAVANNAH GA.

DURING the visit of Lafayette to Savannah, Ga., in 1825, he laid the corner-stones of two monuments which it was proposed to erect to the memory of General Nathaniel Greene, and Count Pulaski. One was laid in Johnson, and the other in Chippewa Square; the first for Greene, and the second for Pulaski. In 1826, the commissioners who had the erection of the monuments in charge advertised for designs for the two structures, and offered premiums of not more than $50, each, "for those two which would most exactly combine simplicity with neatness, and economy with durability." As little success was had in collecting funds by private subscription, the Legislature granted authority to raise by lottery the sum of $30,000, to aid in the erection of the monuments. Unable, even in this way to raise a sufficient amount for both, the commissioners decided to erect one monument in memory of the two heroes, and the one in Johnson Square was completed in 1830. The design was furnished by William Strickland, the architect of the old United States Bank, in Philadelphia, and the State Capitol, at Nashville, Tenn. It is described as "an obelisk of white marble, fifty feet high, resting upon a base twenty by eleven feet. Pedestal eight feet five inches, by four feet eight inches, rising thirteen feet, and surmounted by a cornice of one foot. From the pedestal, a needle, composed of only seven pieces, each of which weighs more than eight thousand pounds. The needle is thirty-six feet high, five feet four inches by three feet at base, four feet two inches by three feet at apex."

Thus reads the explicit description of the architect of this "needle" memorial. He adds that "the style of architecture is Doric." The cost of the monument is unknown. It is made of marble from New York State, and from a locality called Kane's quarry. Although it was erected to Greene and Pulaski, and was so known for more than half a century, there was not a word of dedication or inscription placed upon it to identify it as having been erected for any purpose, to any person, or for any thing. Occasionally, during the succeeding years, an effort was made without avail, through the newspapers, to awaken public interest to the necessity of at least indicating to the world that the monument had a purpose. It remained, however, as devoid of human interest as though it had been buried in Egyptian sands. One generation passed, and another came, bringing with it, as a covering to the Kane marble, a tender parti-colored moss, that gave the monument the appearance of some huge tropical vegetable, growing into instead of out of the earth.



Monument to Pulaski, Savannah, Ga. R. E. Launitz, Sculptor.

Meantime, the commissioners had renewed their Greene and Pulaski Monument Lottery charter, and raised $20,000, for a monument to Pulaski. In May, 1852, they chose a plan prepared by Launitz, and contracted with him for its erection for the sum of $17,000. It is fifty-five feet high, and made of Italian marble. Its original site was changed from Chippewa, to Monterey Square, where another corner-stone was laid, with imposing ceremonies, October 11, 1852, the seventy-fourth anniversary of Pulaski's death. The monument was erected in December, 1854. It is thus inscribed:

PULASKI
THE HEROIC POLE
WHO FELL MORTALLY WOUNDED
WHILE FIGHTING FOR AMERICAN LIBERTY
AT THE SEIGE OF SAVANNAH,
9 OCTOBER, 1779.

The description of the monument, as given by Launitz in his letter to the commissioners is as follows: — "In designing this monument I have had particular regard to purity of style, richness of effect, and strength and durability in material and execution, while I have not lost sight of the main object, which is to design a monument for Pulaski.

"It is perceived, at the first glance, that the monument is intended for a soldier who is losing his life, fighting. Wounded, he falls from his horse while still grasping his sword. The date of the event is recorded above the subject. The arms of Poland and Georgia, surrounded by branches of laurel, ornament the cornice on both sides, or fronts. They stand united together, while the eagle, emblem of liberty, independence and courage, rests on both, bidding proud defiance. The eagle being the symbolic bird both of Poland and of America, the allegory needs no further explanation. The inverted cannons on the corners of the die are emblematic of military loss and mourning, while they give to the monument a strong military character.

"To facilitate the execution of the shaft, which would be impossible to execute in one piece, I have divided the same into several parts, separated by bands, so as to remove the unsightliness of horizontal joints on a plain surface. The bands are alternately ornamented with stars, emblems of the States and Territories now existing and in embryo, that enjoy, and will enjoy, the fruits of the valor and patriotism of the heroes of the Revolution. The garlands on the alternate bands above the stars, denote that the States are green and flourishing. The shaft is surmounted by a highly elaborate Corinthian cap, which adds richness, loftiness, and grandeur to the structure. The monument is surmounted by a statue of Liberty, embracing with her left arm the banner of the stars and stripes, while in her right hand is extended the laurel wreath. The love of Liberty brought Pulaski to America; for love of Liberty he fought, and for Liberty he lost his life. Thus, I thought that Liberty should crown his monument, and share with him the homage of the free."

THE GREENE STATUE.

Before the close of the War of Independence, and soon after the death of Greene, the Continental Congress passed a resolution to erect a monument to his memory, but like many similar schemes proposed by that ancient body, nothing has ever been done about it. Curiously enough the resolution embraced an inscription that was to be placed upon the future structure. About 1870, the State of Rhode Island, commissioned the late H. K. Brown, sculptor, to execute a marble statue of Greene, to be placed in the Hall of Sculpture in the Capitol at Washington.

Gen. N. Greene, Washington, D. C.
H. K. Brown, Sculptor.

In June, 1887, at the suggestion of Mr. Clark, the architect of the Capitol, the Secretary of War caused to be inscribed on the pedestal of the statue the inscription above referred to. It reads as follows:

"Sacred to the memory of Nathaniel Greene, Esquire, a native of the State of Rhode Island, who died on the 19th of June, 1786, late Major-General in the service of the United States and commander of their army in the Southern Department. The United States, in Congress assembled, in honor of his patriotism, valor and ability, have erected this monument."

Meanwhile, what has become of the man-forgotten but moss-covered object in Savannah? Finding that neither public interest nor patriotism, nor the recommending charms of a lottery could mark Greene's name upon the Doric needle, after more than fifty years of effort, a member of the City Council of Savannah conceived the happy thought that the Georgia Historical Society ought to take the matter in hand and see what they could do. Accordingly, in 1883, a committee from each of these two bodies met together and solemnly discussed the situation, but succeeded in finding no solution of the difficulty. There the "needle" was, proof against the desecrating hand of forgetfulness and ingratitude. To approach it directly was impossible, but a flank movement might succeed. So it was thought that, as the one hundredth anniversary of the Chatham Artillery would be celebrated in May, 1886, it would be a good plan to use that occasion

[1] Continued from page 61, No. 606.

as a motive in awakening interest in the necessity of appropriately inscribing Greene's name upon the monument. The proposition met with public approval, and one thousand dollars were raised to pay for two bronze panels, which were placed upon the monument and unveiled May 6, 1886.

"The one on the south side of the die bears a wretched high-relief portrait of General Greene, accompanied by an orderly and a rearing horse." On the opposite side of the die is this inscription:

"MAJ. GEN. NATHANIEL GREENE,
BORN IN RHODE ISLAND, 1742,
DIED IN GEORGIA, 1786.
This shaft has been raised by the people of Savannah in honor of his great service to the American Revolution.

The panels were made by Gabriel Turini, of New York.

We know of no American patriot of the Revolution who has been treated with as much contumely as General Greene, so far as monument and statue memorials are concerned. Many of his military comrades have no memorials, and few know where their ashes repose. It is better that it should be so, because, next to honored remembrance in art, is seclusion from caricature, as illustrated in the objects set up to the memory of General Greene. As a final instance of the indifference with which the Greene monument was regarded by the city of Savannah it should be mentioned that when, in 1829, the commissioners asked the City Council for permission to enclose the square, in which it stands, with an iron fence, their petition was granted "upon condition that it be done without cost to the city."

It would be interesting to know why the memory of Pulaski was uppermost in the hearts and pockets of the people of Savannah, in 1852, while that of Greene awakened no response.

It is a pity, though perhaps not surprising, that the Pulaski monument cannot be taken as a starting-point of future progress, by the people of Savannah, in the art of monument-building. It is probably the finest example of its author's skill and taste, and certainly one of the very best public monuments existing in the United States. As an architectural effect, the Washington column at Baltimore, is superior. The Pulaski represents the best skill the country possessed at the time of its erection, and it was made without reference to the cost of time or money. Not a single public monument of which we have any knowledge, has since been erected that represents anything like the skill existing in the country. It was a common remark of Launitz that the majority of his best monuments, of all descriptions, were made for the South, and it is the most natural thing in the world to suppose that the effect of these works would have been in the direction of progress, in the refinement of taste and sensibility, if such a thing were possible, and if not, the next thing to it, a hesitancy to erect anything less meritorious. But it appears that the South, like the North, has gone backwards in this matter, and that material instead of skill, and oddities instead of tasteful expressions, are now the most acceptable forms for monumental purposes.

CONFEDERATE SOLDIERS' MONUMENT, SAVANNAH, GA.

One of these unfortunate structures is found in the Confederate Soldiers' Monument, at Savannah, Ga.

It resembles a frightfully-formed and heavily emblem-ladened church steeple. Designed and executed by Robert Reid, of Montreal, Canada, it is fifty feet high, made of Nova Scotia sandstone, and cost, with freight and duties $21,250.

It was unveiled May 24, 1875. As originally built, it was surmounted by a statue of Italian marble, and another statue of the same material was enclosed in the column-supported canopy section of the monument. It was also intended to place marble statues of Confederate soldiers on the corners of the die.

In 1878 Mr. G. W. Renne, a citizen of Savannah, proposed to the Ladies' Memorial Association, through whose exertions the monument had been built, that, with their consent, he would have a bronze statue of a Confederate soldier made and placed upon the summit of the monument in place of the marble statue, at his own expense. Consent was given, and the present statue placed in position May 21, 1879. At the same time the statue in the canopy was removed, and the opening closed with stone.

The statue bears on its plinth the words: "D. Richards, Sculpt. 1879.—M. J. Power, Founder, N. Y."

The entire cost of the statue has never been made known, though the sculptor received for his work the lordly sum of $500. It is one of the unnumbered figures executed since the Civil War, by a sculptor without professional reputation, and for a monument contractor. That it has more character than any figure of a soldier in the whole country is saying very little in its favor. It is more direct and complete in its conception, and has more individuality than any statue in the United States, the Jefferson, by David d'Angers, barely excepted.

Confederate Soldier, Savannah, Ga. D. Richards, Sculptor.

As a soldier, he is worn out, and conquered. As a man, he faces the future with sad but firm countenance. The upright modesty of the body, the uncertainty of the action of the arms and lifeless hands, and the unaffected general position of the whole figure, make it a Confederate soldier, and nothing else. They also show that the sculptor has comprehended his subject with the perception of a master. In all that which makes a work of sculpture in distinction from a piece of modelling, it is far superior to the Farragut, by St. Gaudens. The latter may be any admiral, and then no more than illustrative in its design, while the soldier is a Confederate, and nothing else. It is also a symbol. The rude shoes and the tattered and overworn clothes have a true and appropriate force. It is really the only statue that has come out of the Civil War.

The Pulaski was the last public monument of importance that Launitz executed. From the time of its erection to the close of his life he was engaged, almost wholly, on private work. He employed, until the breaking out of the Civil War, about thirty men, mostly foreigners. In 1861, he had no American in his employ. The designs he executed included a large variety of the best styles of monuments known in the art. It is the regret of the writer that he found it impossible to get illustrative examples of these works. Some of Launitz's best monuments went to small graveyards in the country, and to family burial places on private estates. This was especially true of the South. His best private shaft monuments are found in Greenwood, in the lots of the Gunther, Harrison, Brooks, Havemeyer and Woods families.

The competition for War Monuments that began as early as 1862, was conducted on principles that Launitz could not practise, or contend successfully against. He stood no chance with the sharp business contractors who introduced the mongrel structures that were set up at Gettysburg, Providence, and in many other cities of the North.

The day of artistic study and integrity, as represented by Launitz, was passing away, and the period of business enterprise, adroitness, and personal influence with committees had begun. He loved his art, cared little for money, and despised the low tricks of the energetic, and unscrupulous Yankee. He almost always failed to ask enough for his work, and was ever tempted to give more than he received.

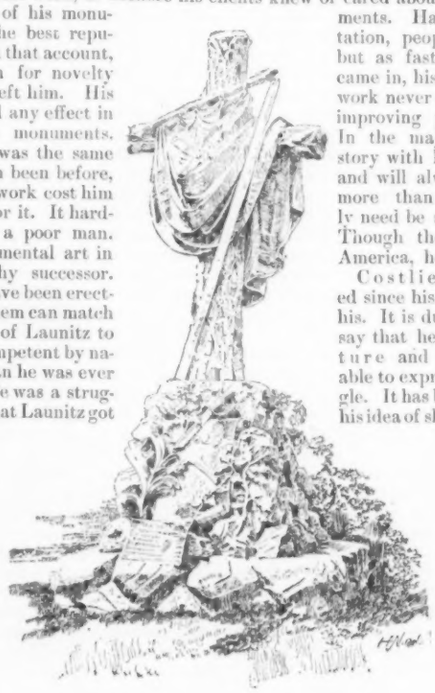
He employed the best workmen in the country, and taught many apprentices. One of the very best assistants he ever had was F. J. Maurer, now, and for many years past, an esteemed teacher in the Cooper Institute School. Another, was John Korwan. Both very capable all round men, who could model beautifully, make designs equally well, and cut marble in the same way. Casper Buberl was one of Launitz's most skilful carvers. He has since became a popular sculptor employed by monument contractors, and shows an illustrative talent quite superior to sculptors of more distinguished repute. Another of his pupils was —— Baerer, an excellent modeller and carver. He also works at sculpture, and is well known in the monument trade. Launitz's workmen in the early days were generally Italians, and among them were Seregrini, Butti, and many others of like talent. John McAllister, at present the most extensive

granite dealer in New York, served his time as a carver with Launitz, and afterwards became his partner. Up to 1860, very few of the foreign skilled workmen who came to New York did not work for Launitz. It gave him pain to let one go. He wanted to make monuments for a world and ought to have been permitted to do so. As an instance of his appreciation of useful men, and his tenacity in keeping them in his employ, the case of John Brawley, ought to be mentioned. Brawley was an Irishman, a polisher and a character. He began to work for Launitz in his first years in New York, and was at that time of such vital service to his employer that he remained with Launitz as long as the latter lived, becoming during that time the best man in the city to set up, move and take charge of monument work.

Confederate Monument, Savannah, Ga., designed by Robert Reid.

It was with Lauford received his first lessons in modelling, and he was only friend who was at the dock to bid the young sculptor "good bye," when he first sailed for Italy.

Launitz knew all the older generation of New York artists, and was on intimate terms with Inman, Durand, Edwin White and others. He was elected a National Academician in 1845, exhibiting a bas-relief of Venus and Cupid. He was better appreciated and more highly esteemed by the best people of the South, than by those of the North. The fire of art-enthusiasm, the extravagance of sentiment, and the social temperament of the warm-blooded Russian, were more agreeable to the Southerner than to the Northerner. Throughout all his life there were but a few instances where he was employed solely because he did the best work, or because his clients knew or cared about the excellence of his monuments. Having acquired the best reputation, people went to him on that account, but as fast as the fashion for novelty came in, his old customers left him. His work never seems to have had any effect in improving public taste in monuments. In the majority of cases it was the same story with him as it has often been before, and will always be, that his work cost him more than he received for it. It hardly need be said that he died a poor man. Though the father of monumental art in America, he leaves no worthy successor. Costlier monuments have been erected since his day, but few of them can match his. It is due to the memory of Launitz to say that he was far more competent by nature and acquirement than he was ever able to express. His whole life was a struggle. It has been suggested that Launitz got his idea of shaft monuments from Schinkel, a distinguished German architect. Others have suggested that they were simply obelisks, with the addition of cap and die. Those most familiar with his individual treatment of other monumental forms assert that his shaft monuments grew out of his natural taste for tall structures, and that the large number that he made represent his persistent attempts to obtain the best expression of that form. We agree with the latter view. Although Schinkel has a high reputation as an architect, his studies of shaft monuments resemble a series of panelled boxes, piled one above another, with thin, meagre mouldings, all producing anything but the effect of a monumental whole. In every one of his tall monuments it is plainly seen that Launitz has aimed to get a good general effect. No one could have a greater regard for the purity of a moulding, its effect in a composition, or the correctness of its execution, than he. His kindness to those who sought his aid in modelling was abundant and unceasing, and many there are who remember him with esteem and affection.



Confederate Monument, Lexington, Ky.

Soldiers' Monument, Providence, R. I. Randolph Rogers, Sculptor.

True to his family instinct he joined the 27th Regiment — afterwards the famous 7th of New York — in less than a year after his arrival in that city, and served as quarter-master for many years. In 1850, he was commissioned as its engineer, with the rank of captain. On receiving this appointment he organized the engineer corps of the regiment, and commanded it with great ability until 1860, when he resigned.

Launitz died December 13, 1870, and was buried in Woodlawn Cemetery, near New York. A simple piece of stone, just large enough to contain his name, birth and death, is all that marks his grave. The man who made so many noble memorials, and helped to carry to posterity the names and deeds of those who deserved a living remembrance, has not so much as the shadow of a cenotaph to honor his final home.

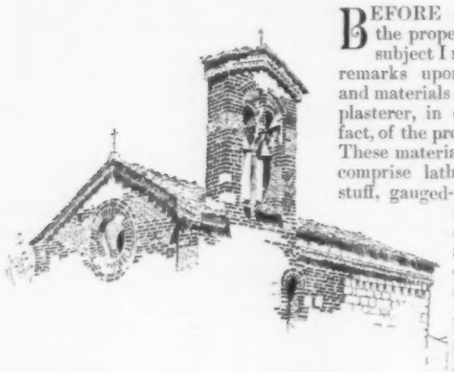
Frazee is even less remembered, for no one knows where he was buried.

T. H. BARTLETT.

EFFECT OF THE ELECTRIC LIGHT UPON BOOKS. — Professor Wiesner of Vienna has just called attention to an inconvenience attending the use of the electric light in libraries. It has been found that a large number of works in the library of the Technical School had become very yellow, and this led the director of the establishment to ask Professor Wiesner to ascertain the cause of it. Experiment has shown that the coloration is due to light, but that it occurs only with paper containing ligneous substances, such as wood, straw and jute, and that it does not take place when, through some chemical process, the lignine that forms the essential part of the wood is removed. The yellowing is due to a phenomenon of oxidation. Solar light acts more energetically than dispersed daylight, which itself exerts but a very slight action when it is much diffused, and especially in a very dry room. Gaslight is nearly harmless, by reason of the few refrangible rays that it contains. On the contrary, as the arc electric light, and, in general, all intense luminous sources, emit numerous refrangible rays, they favor the yellowing. As regards the preservation of papers, then, it will be well to choose gas rather than the electric light for the illumination of libraries. — *Revue International de l'Electricité.*

HINTS FOR BUILDERS.[1]—IV.

MASONRY AND MASON'S WORK.



From the Architect. Bell Turret, Asciano, Italy.

BEFORE going on with the proper division of the subject I must make a few remarks upon the mixtures and materials employed by the plasterer, in continuation, in fact, of the preceding chapter. These materials and mixtures comprise laths, hair, coarse-stuff, gauged-stuff, stucco, rough-cast, and scagliola. Laths are usually made of Baltic fir or spruce, the younger trees being cut into lengths and split down the centre, and it is in this form that lath-wood is imported. The laths are split from these logs, and are classed according to their thickness, as single — $\frac{3}{16}$ inch thick, lath-and-a-half-lath, $\frac{1}{4}$ inch thick, and double laths $\frac{5}{8}$ inch thick. They are usually between three or four feet in length, and one inch in width, and are sold in bundles containing nominally 100 good laths, and should be free from all shakes, knots, or splits. Oak and iron laths are occasionally employed, and sawn laths have the advantage of being of a uniform thickness, and require less mortar on them to set a level surface. The disadvantage, however, with them is that they are liable to break off short.

Hair is usually ox-hair obtained from the tanner's yard. It should be long, strong and sound, free from all grease and dirt, and should be well beaten before being used, in order to separate the hairs.

Coarse-stuff, or what is known as hair-mortar, is made by mixing two parts of sand to one of lime, one pound of hair being added to every two or three cubic feet of mortar. It is employed for the first coat in two-coat work, or for the first and second coat in three-coat work. The quantity of hair should be such that when the mortar is taken up on the trowel it will hang over the edge without dropping off. The stuff for walls does not require so much hair as that for ceilings. Fine-stuff is pure lime, slaked with a small quantity of water, and afterwards thinned with water till it is of a creamy subsistence. It is then left to settle in a vessel made purposely, when the water runs off and evaporates. It is employed for the setting or finishing coat in ordinary plastering.

Putty is fine-stuff made fit for use. In some cases it is prepared rather differently from fine-stuff by running it through a fine sieve.

Gauged-stuff, or putty and plaster, is fine-stuff mixed with plaster-of-Paris in the proportion of three of fine-stuff to one of plaster, more of the latter being employed if quicksetting is required. It must be mixed in small quantities, and is employed for cornices, mouldings, etc. Too much plaster must not be used, as it causes the work to crack through setting too quickly; and in all cases where plaster-of-Paris forms a constituent, too much must not be mixed at one time as it loses its virtues by exposure and mixture.

Stucco is of four kinds, known as common, trowelled, bastard and rough. The first, or common stucco, is composed of three or four parts of clean, washed sand to one of lime; when coarse sand is used with the lime, and the finished surface is roughened with a hand-float covered with felt it is called rough stucco. Trowelled stucco is composed of fine-stuff and sand, two-thirds of the former to one-third of the latter, very clean; it is used for the finishing of surfaces which it is intended to paint. The addition of a little hair to this makes bastard stucco. Rough-cast is sand-grit, or gravel, washed and mixed with hot lime and water. It is employed in a semi-fluid state.

Scagliola, or imitation-marble, is plaster-of-Paris mixed with different coloring-matters in a solution of glue or isinglass, and is used for columns, pilasters, and walls. The surface to be covered is first pricked up, or rendered, with ordinary hair-mortar, and the prepared surface-mixture is then applied. After it has become thoroughly hard it is rubbed down with pumice-stone, a wet sponge being used to keep it damp and clean; it is then rubbed with tripoli and charcoal, polished with a felt rubber dipped in tripoli and oil, and finished with a piece of felt dipped in oil only.

Ornaments in plaster are made either in plaster-of-Paris, composition, carton-pierre, or papier maché, plaster ornaments being cast in wax or plaster moulds. The ornaments are first modelled in clay; when this has became somewhat hard it is put into a wooden frame suited to it, and retouched to make it perfect, and well oiled all over. Melted wax mixed with resin is then poured into the frame, covering the model, and is then left to get cool and firm; the whole is then dipped into water, and turned upside down, when the wax mould comes freely away from the model, and is ready to be used for casting. For running mouldings the mould is generally made about one foot long, as the castings are more easily taken from them than if made of greater length. The casts are made of the best quality of plaster, and the moulds are well oiled.

Plaster moulds are generally employed for large undercut ornaments, as they can be broken up. A clay model is made as above detailed, and the plaster is fitted on to it in pieces; when dry the whole is immersed in boiling linseed oil. Composition ornaments are made by mixing together resin and oil; this is put into glue dissolved in water; whiting is then ground to powder, and made of the consistency of soft putty; upon this the mixture of oil, resin, and glue is poured, and the whole is forced into box-wood moulds carved to the pattern. Carton-pierre and papier maché are used for large ornaments on account of their extreme lightness. The first is composed of paper pulp mixed with whiting and glue, and forced into moulds, they are then backed with stout paper, and placed in drying-rooms to become firm. Papier maché is made in two ways. (1) Sheets of paper are fastened one over another with glue, and forced into metal moulds of the shape required: sometimes a mixture of paper pulp and resin is first put into the moulds, and then the sheets of paper; this makes the lines of the ornament clearer and sharper than the paper alone. (2) Pieces of paper are boiled and made into a paste mixed with size, and forced into the moulds by a counter mould; the ornament is thus made of a thickness of about one-fourth inch. Although lathing is very often considered a portion of the plasterer's work, still in many places it is pursued as a separate trade. All laths should be fixed about three-eighths inch apart, the ends should not overlap, and they should be fixed with zinc nails at every point of support — this last necessity is not so often borne in mind as it should be.

Having now touched upon plastering in all its details, I shall proceed now to a consideration of masonry and masons' work. Masonry is the art of shaping and uniting stones for the various purposes of building, and though there has been some dispute over the derivation of the word *mason*, it is now generally accepted as having come from the Latin *maceria*, a long wall; while it also appears to be the same word as *maison*, a house or mansion. Masonry includes the hewing of stones into the various forms required, and the union of them by level, perpendicular or other joints, or by the aid of cement, iron, lead, or any other substance or mixture. The operations of masonry require much practical dexterity, together with a certain amount of knowledge of the laws of geometry and mechanics. Probably the earliest masonry is that of the Egyptians, which is in the main remarkable for the extraordinary size of the stones employed, which are often as much as thirty feet in length, and fitted without the aid of mortar, and this not because this composition was unknown. The Cyclopæan masonry alluded to by Homer, some remains of which exist at Mycenæ and at Tiryns, are formed of large and irregularly shaped blocks of stone, with the interstices filled with smaller pieces. Etruscan masonry consists of irregularly shaped masses of stone fitted together with perfect exactitude, and of this description of masonry the more ancient remains of Greece and Italy afford very numerous examples. The next improvement in masonry appears to have been in working the stones so as to make the joints or beds horizontal, or nearly so, while the vertical joints were made straight, but not perpendicular to the horizontal ones, specimens of this sort being found at Fiesole and elsewhere. All walls of this kind were put together without the aid of mortar. For the ordinary purposes of walling, the Greeks and Romans employed several methods, such as the *incertum*, now known as rubble, made with stones of irregular shapes and sizes; the *opus reticulatum*, so-called from its network appearance, and formed with square stones laid diagonally; *isodomum* and *pseudisodomum*, in which the stones were formed in regular courses — in the former of equal height, but unequal in the latter; and *emplectum*, in which only the facings were uniform, the centre being filled up with rubble. In all these descriptions of masonry, the stones were small and laid in mortar, much of which has lasted to our own day. The Romans were very partial to courses of tiles in their masonry, the flat surface making a good bond. After the Romans quitted Britain, the masonry in all probability consisted of the coarsest rag or rubble work. In a few of the early buildings, considered by some authorities to be Saxon work, the quoins, the jambs of doors and windows, and, at times, other parts, which are built of hewn stone, are formed of blocks alternately laid flat and set up on their ends, the upright ones being usually of considerable length in proportion to the others, hence the term of long-and-short work applied to this system. In the early Norman style walls were built on the inside face with rubble plastered, and the outside was often the same; in large buildings this was frequently of ashlar, with wide coarse joints, and the mortar made with coarse unsifted sand or gravel. In the early part of the twelfth century the masonry generally improved, the mortar was finer, the stones were set with close fine joints, and ashlar was more generally used for the external, as also for the internal work. Throughout the Norman style the stones of the plain ashlar work more generally approached to cubes in shape, and the courses varied from about six to nine or ten inches in height, while in rubble walls herring-bone work was frequently employed. In late Norman work the stones used in the facings of walls were cut into various shapes for the sake of ornament, the simplest being the *opus reticulatum*, in which the stones were reduced to squares and laid angularly. In the Middle Age masonry the stones were very seldom larger than could be lifted by a couple of men, and they were often small enough to be lifted by one man only. On the expiration of the Norman style,

[1] Continued from page 63, Number 606.

masonry had no characteristics sufficiently decided to mark its date, except where flints were used.

Although a variety of descriptions of masonry are practised at the present day, they can all virtually be classed under three heads, rubble, in which the stones are used without being squared; coursed, in which the stones are more or less squared, sorted into sizes, and ranged in courses, and ashlar, in which each stone is squared and dressed to given dimensions, this last term in London being generally applied to a thin facing of stone placed in front of brickwork, though the technical terms vary in different parts of the country, and in the United States.

In the general modern practice of stone walling, the bedding joints should always be horizontal, when the top of the wall is to be terminated horizontally. In bridge building and in the masonry of fence walls upon inclined surfaces, the bedding joints may follow the general direction of the work. The footing of stone walls should be constructed with stones as large as can be conveniently procured, squared and of equal thickness in the same course, with the broadest bed downwards. The vertical joints of an upper course must break joint, that is, must not fall on those below. If the walls of the superstructure be thin, the stones comprising the foundations may be so disposed that their length may reach across each course from one side of the wall to the other. Where the walls are thick and stones cannot be procured of a sufficient length to reach across the foundations, every second stone in the course may be a whole stone in breadth, and each interval may consist of two stones of equal breadth, as in bricklaying when employing a header and stretcher alternately. If these stones cannot be procured, a header and stretcher must be laid alternately from one side of the wall, and from the other side another series of stones in the same manner, so that the length of each header may be two-thirds, and the breadth of each stretcher one-third of the breadth of the wall, and so that the back of each header may come in contact with the back of an opposite stretcher, and the side of that header may come in contact with the side of the header adjoining the said stretcher. In foundations of some breadth, for which stones cannot be procured of a length equal to two-thirds the breadth of the foundation, the work should be so built that the upright joints of any course may fall on the middle of the length of the stones in the course below, and so that the back of each stone in any course may fall on the solid of a stone or stones in the lower course. The foundation should consist of several courses, each decreasing in breadth as they rise by offsets on each side of three or four inches in ordinary cases. The number of courses is of course regulated by the weight of the wall, and by the size of the stones composing these foundations or footings.

Rough rubble masonry, whether set dry or in mortar, consists of stones of small dimensions, upon which very little labor has been bestowed, and that only in quarrying. None of the stones should be larger than a man can lift, and a good worker can always find a place handy for all such stones. Rough or random rubble masonry may be set dry or in mortar, but dry it forms fence and retaining-walls or protects foundation-walls from clay, marl, or wet earth; amongst forms of this description of masonry may be specified random rubble set dry, in mortar, or with quoins, joins and architraves levelled in courses; snecked rubble, also set in courses; rubble with ashlar binders, in alternate courses with bricks or tiles; flint rubble, whole or cut, and boulder or pebble rubble, used whole or cut, when brick, tile or stone quoins or courses are employed therewith.

Slate rubble is set in horizontal beds, having an angle of forty-five degrees. In random rubble the stones are used just as they are taken from the quarry, any sharp projection being struck off with the scabbling hammer, and what bond there is being simply obtained by the inequalities of adjoining stones fitting into each other. Good mortar and carefully-adjusted stones, not being afraid to employ large ones, will ensure good sound, durable work. In coursed rubble masonry the stones are but little dressed, or not at all, as usually they are brought from the quarry and are sorted into heaps according to size. They must be carefully laid in good mortar, with headers and stretchers, so that they break joint, while chips of stone are employed to fill up any unsightly cavity. In ashlar masonry stones of larger size are employed than in the preceding styles of stonework. The least depth of each block in ashlar should be twelve inches. All the stones must be carefully dressed, and particular attention paid to the joints, in order that the courses should run truly parallel and horizontal. In the better class of ashlar masonry the faces of the stones are "rubbed."

The upper part of a top stone is termed the "top bed," and the under portion the "lower bed," the front being called the "face," and the vertical joint opposite to the face the "back." "Headers" and "stretchers" are employed alternately in each course. Stone-cutting may be practised in a variety of ways, the formation of as many plane surfaces as may be desired, with the least possible loss of material, being the end and aim of all. In dealing with a block of stone, its bed, which is usually one of the largest sides of the block, should be first formed, and reworking always obviated as far as practicable. Care should also be exercised that the beds of stones are never worked concave, as in that case the pressure will be borne on the elevated edges, and there will be a tendency in the stones to flush or break off in flakes at the joints, which has a very detrimental appearance upon the work, beside imparting the idea of want of stability in the wall. Convexity of bed, if very slight, is to be preferred to concavity, but of course a perfectly level surface is best of all. And I would here remind the reader that it were well to make himself acquainted thoroughly with advanced handbooks dealing fully with the matter, for the mason, if he desire to become something more than a mere hewer of stone or rough waller, should study these works and should also aspire and practise to become a thoroughly efficient and artistic draughtsman, while he should also thoroughly master the problems of Euclid, as the processes by which the forms of the various blocks of stone employed in any considerable edifice are based upon strict geometrical principles and laws.

Walls are most commonly built with an ashlar facing and backed with brick or rubble work, this being especially the case in those places where stone is expensive. Walls faced with ashlar and backed with brick or rubble are very liable to become convex on the outside from the greater number of joints, and consequently from the larger quantity of mortar placed in each joint, as the shrinking of the mortar is in proportion to the quantity. Such a wall is, therefore, inferior to one wherein the facing and backing are of the same kind and constructed with equal care, even supposing both sides to be of uncoursed rubble, which is the worst description of walling. Where a wall consists of an ashlar facing outside and the inside of coursed rubble, the courses at the back should be as high as possible, and the beds should contain very little mortar.

Coursed rubble and brick backings admit of the introduction of bond timber; but wooden bonds should not be continued in length, for, unless employed sparingly, they weaken the masonry, making the wall exceedingly liable to bend. It is better to introduce only such small pieces, with the fibres of the wood perpendicular to the face of the wall, as are required for the fastenings of dressings and battens. The ashlar facing the stones usually rise from twenty-eight to thirty inches in length, twelve inches in height, and eight or nine inches in thickness. Although the upper and lower beds of an ashlar, as well as the vertical joints, should be at right angles to the face of the stone, and the face, bed and vertical joints at right angles to the beds in an ashlar facing, yet, when the stones run nearly of the same thickness, it is of more advantage, in respect of bond, that the back of the stone be inclined to the face, and that all the backs, thus inclined, should run in the same direction, since a small degree of lap is thus obtained in the setting of the next course, whereas, if the backs are parallel to the front, no lap can take place when the stones run of an equal depth in the thickness of the wall.

It is also of advantage to select the stones, so that a thick and a thin one follow each other alternately. The disposition of the stones in the next superior course should follow the same order as in the inferior course, and every vertical joint should fall as nearly as possible in the middle of the stone below. In every course of ashlar facing in which the backing is composed of brick or rubble, or in cities where stone is dear and difficult to obtain, bond or through-stones should be introduced, their number being, of course, in proportion to the length of the course; and each of these stones, if in a superior course, should fall in the middle between every two like stones in the course below. In piers, where the jambs are coursed with ashlar in front, every alternate jamb-stone should go through the wall with its bed quite level. If the jamb-stones are of one entire height, as is very often the case when architraves are wrought upon them, and also upon the lintel crowning them, every alternate stone of the stones at the ends of the courses of the pier which are to adjoin the architrave-jamb, should be a bond-stone, and if the piers be very narrow between the apertures, no other bond-stones will be necessary in such short courses. With wide piers the number of bond-stones must be proportioned to the space. Particular attention must be paid to bond-stones in courses above and below windows and all other openings. In such cases their sides must be parallel and perpendicular to each other, and their horizontal dimension in the face of the work not less than the vertical one. The vertical joints, after receding about three-quarters of an inch from the face of the work with a close joint, should widen gradually to the back, so as to form hollow wedge-like spaces for the mortar and packing. The adjoining stones should be fixed with thoroughly good mortar. All the stones of an ashlar facing should be laid on their natural beds; unless this be attended to, the stones are apt to flush at the joints, and this promotes decay from the action of the atmosphere. Where walls or isolated pillars of small dimensions are to be carried up, the stones should be bedded quite level, and not concave, or the joints will flush, and it is an advantage, where practicable, to make every course in the masonry of a pier or pillar in one stone. The next best arrangement to have the courses as few as possible, the joints hidden to the greatest possible extent, and the grain to run in one direction. Vertical joints on columns must never, under any pretext, be permitted.

On the art of dowelling I shall not now touch, as the forms and methods of these are so many that it were best for the mason to pursue his own plan; the most usual is to have them of hard stone run with cement or with iron, and then run with lead, half of the dowel being, of course, in each stone. The same remark will also apply to joggles and the various other methods of uniting stones.

Besides the saw, the mason uses chisels made of iron, with a steel-cutting edge, a wooden mallet, a level, or plumb rule, a bevel, a square, straight and circular rules of various descriptions, and at times the pointer, the boaster, the inch tool and the broad tool, while scabbling hammers are at times also required.

With this my remarks upon masonry — which I must again impress upon my readers are only intended for students and juniors — must terminate. In my next I shall deal with warming and

ventilation, the present concluding really the builders' section of my series.

W. N. Brown.

[To be continued.]

The Illustrations

[Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.]

THE LINCOLN BUILDING, LINCOLN STREET, BOSTON, MASS. MESSRS. CUMMINGS & SEARS, ARCHITECTS, BOSTON, MASS.

[Gelatine print, issued only with the Imperial Edition.]

ST. PETER'S CHURCH, MORRISTOWN, N. J. MESSRS. McKIM, MEAD & WHITE, ARCHITECTS, NEW YORK, N. Y.

THE building is in an advanced stage of construction. Local stone is being used for the exterior, the interior being faced with Pittsburgh yellow brick. The traceried windows are of stone and the glass is set directly into the tracery.

The chapel has a stone floor, there being no pews, but chairs, and is intended for the smaller services of communion, marriage, funeral, baptism, etc.

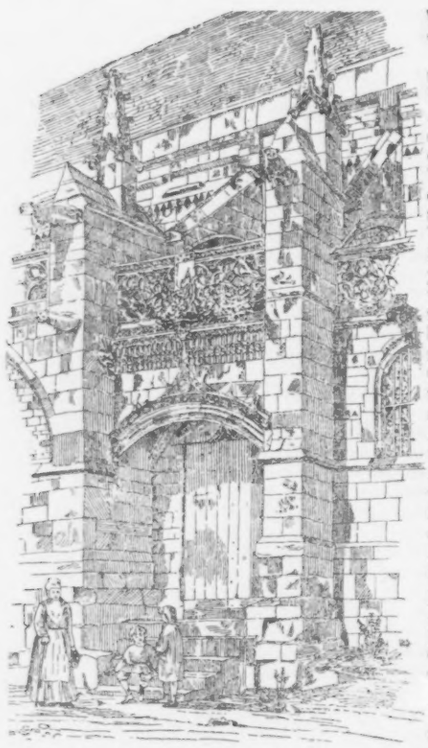
The church will seat six hundred persons, and the estimated cost of the building is $125,000.

OLD PROVIDENCE BANK BUILDING, PROVIDENCE, R. I.

THE PRATT INSTITUTE, BROOKLYN, N. Y. MESSRS. LAMB & RICH, ARCHITECTS, NEW YORK, N. Y.

HOTEL DE VILLE, AMBOISE, FRANCE.

AMERICAN MARBLES.[1]



S.E. Porch, St Gilles. Caen.
After a Drawing by M. F. Bedford in The Builder.

THE rise and progress of the marble trade in the United States of America has been of a most extraordinary character. The first marble quarry in the country was opened in Vermont in 1785. Shortly before the year 1800, works were erected for the sawing of marble at Marbledale, near New Milford, Conn. It is said that the first tombstone made out of American marble was erected in 1790, and was the work of one Jonas Stewart, a marble-cutter of Dorset. An examination of the headstones in the graveyard at New Milford proves that the oldest of them are of sandstone from the Connecticut Valley, and of slate. Those of somewhat later date are of marble, and have been evidently worked by hand from the rough block. Those bearing a date soon after the beginning of the present century have been cut on one or both sides with a saw. The date of the first working of American marble is, therefore, fixed with tolerable certainty, and it is evident that a trade which has now assumed enormous proportions has been built up in less than a century.

Marble is now used for building purposes in the States on a scale which may astonish the architects of the Old World. In New York it is superseding the brown freestone or sandstone, of which such a great part of the city is built. The great bulk of the trade centres in Vermont. In that State the quarries are worked with every mechanical means which the ingenuity of man has been able to devise. In the year 1882 it was calculated that the capital invested in the production of American marble in the States of Vermont, Massachusetts, Connecticut, New York, Pennsylvania, Maryland and Tennessee was £2,500,000 sterling, two-thirds of which was invested in quarries, and one-third in mills and machinery. The number of workmen engaged was 6,000, and the annual production amounted to 2,200,000 cubic feet, valued at £900,000.

The principal workings in Vermont are at Sutherland Falls, Rutland and Dorset. The Sutherland Falls marble is mottled and veined in a manner peculiar to itself. Some of it is dark, with a ground of deep blue with nearly black veins. Another variety is nearly white with clouded veins. Both descriptions are sound, and take a good polish. Quarrying operations were commenced in 1836, although they were not pursued with much spirit until some years later. The quarries are well situated, above the railroad and mills, so that blocks are readily transported. The falls of the Otter are made use of as a motive power to drive the saws, the polishing-beds in the finishing-shops, and the drills in the quarry. It was here that the first successful channelling-machine was employed. These machines are now in operation all over the States. It is calculated that since 1863 over five millions of square feet have been cut by them. The channeller is a locomotive machine which runs on steel rails placed on the quarry floor. The gang of cutters forming the drill is composed of five steel bars, 7 feet to 15 feet long, sharpened at the ends, and securely clamped together. The centre cutter is the longest, and the two outside cutters are the shortest, so that the five form a kind of stepped arrangement away from the centre. As the machine runs backwards and forwards over the rails the cutters deliver their strokes at the rate of 150 per minute. Deep, narrow furrows are cut into the solid stones, and long parallel blocks are thus formed. Close after the channeller runs the gadding-machine. This drills circular holes along the bottom and sides of the blocks, into which wedges are introduced, and the stone is split from the bed. The Wardwell channelling-machine, which is most commonly in use, cuts a continuous groove at the rate of 75 to 150 square feet per day, thus doing the work which could be done by 50 to 100 men by the old hand-process. The expense of working the machine is about £2 per day. The advantages gained by use of the machines are therefore obvious. The diamond gadder does its work at the rate of 180 feet per day, as against 12 feet by hand labor. Three men are required for each channeller, and two for each gadder. As a consequence of this mode of getting the stone, the quarry appears like a hollow cube cut into the hill. The sides are nearly perpendicular walls, and the bottom is a marble floor over an acre in extent. Across this floor the channelling-machines work.

Sutherland Falls marble is much used for building purposes. The spire of Grace Church, New York, is built of it. The formation of the beds gives great opportunities for the extraction of large blocks. A small town has been built near the Falls for the accommodation of the workers.

At Rutland a pure white marble is found. There are several quarries in the neighborhood of the town, and the marble bears a high reputation. There are quarries of clouded and veined white, and of dove-color as well as statuary. The marble is found on the western slope of a range of low hills running north or south. The thickness of the beds worked varies from 50 feet to 120 feet. They are inclined at an angle which averages about 45°.

Quarrying operations were commenced in the year 1838, and a few years later trade in "Rutland marble" had become firmly established. The deposits proved to be adundant and of sound quality, and were sources of large profits to the proprietors. The marble industry of Rutland has been a prosperous one, and at the present time it is calculated that some 2,000 men find employment in the quarries, mills, and workshops. Rutland statuary is said to be too soft for ordinary purposes. This complaint may possibly arise from the fact that the principal supply has hitherto been produced from the upper layers. It is now claimed that the lower layers have produced a statuary which is of a much better texture than any formerly worked. At the State House in Montpelier there is a statue of Ethan Allen of heroic size; this is the work of Larkin J. Mead, and is sculptured out of Rutland marble. The marble is certainly not so easy to work as that of Italy; it is what is called "plucky"—that is, given to breaking away before the chisel, unless great care is used.

The sand-blast was first employed for the cutting of marble at some marble works in West Rutland in 1875–76. A contract was taken by which 254,000 lettered headstones, having dimensions of 3 feet in length, 10 inches in width, and 4 inches in thickness, were placed in the national cemeteries at an expense to the government of about £173,000. The monuments were for the purpose of marking the graves of soldiers, and the application of the sand-blast for the purpose of cutting the inscriptions, enabled the work to be so cheaply done. Letters and figures of chilled iron were placed on the stone to be cut, and the blast was then turned on; the portions of the stone unprotected by the iron were eaten away by the force of the blast, and the inscriptions were left standing in relief. By this method the name, company, regiment, and rank of a soldier could be put upon a stone in less than five minutes of time.

Between Rutland and Sutherland Falls there is found the quarry of the Columbian Marble Company. This marble is almost black,

[1] One of a series of papers on "Marble and Marble-Workers," by Arthur Lee, published in the *Building News*.

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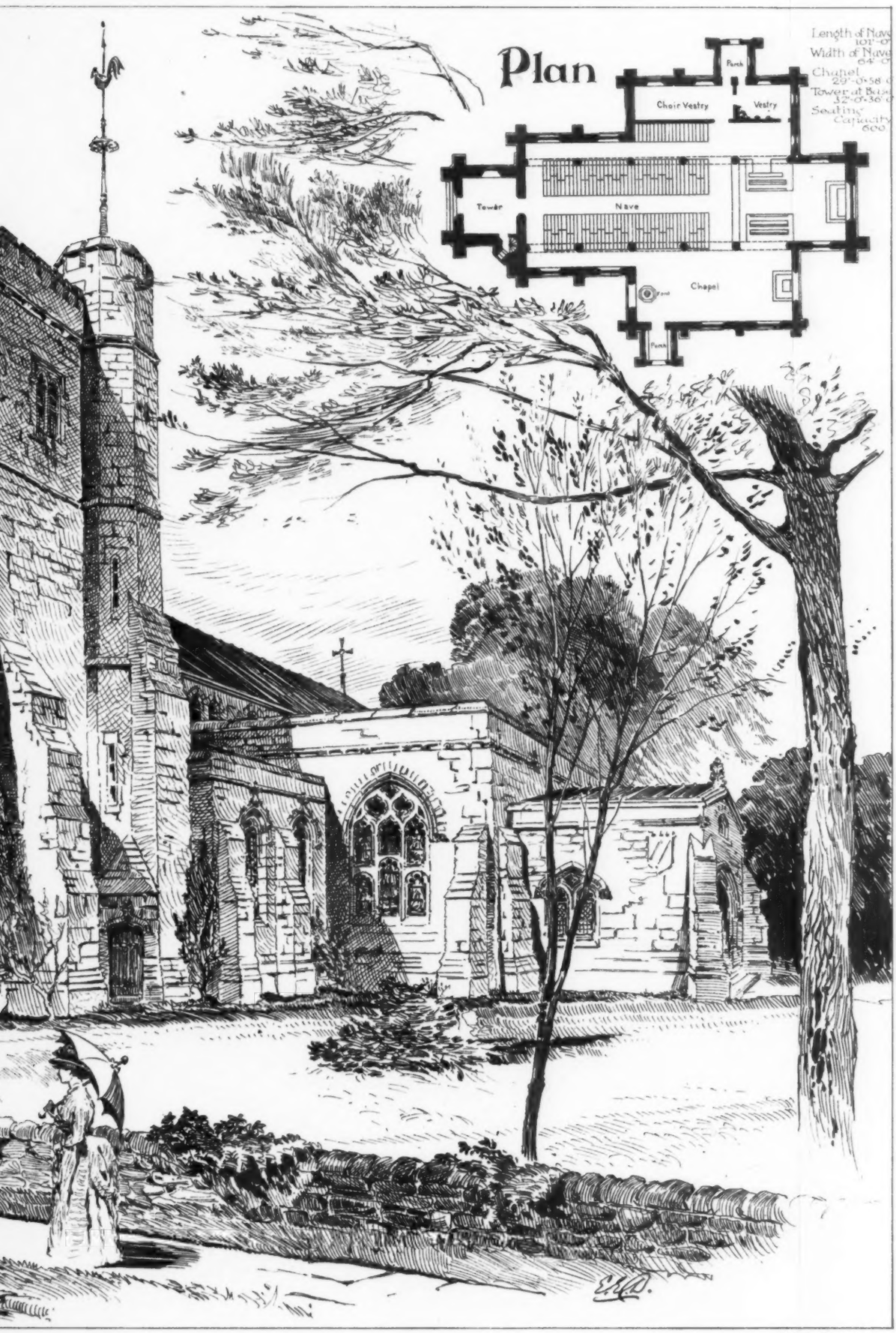
St. Peter's Church
Morristown, N. J.

McKim, Mead & White, Archts.
57 Broadway, New York city.



Heliotype Printing Co Boston

American Architect and Building News, Sept. 31887. No. 610

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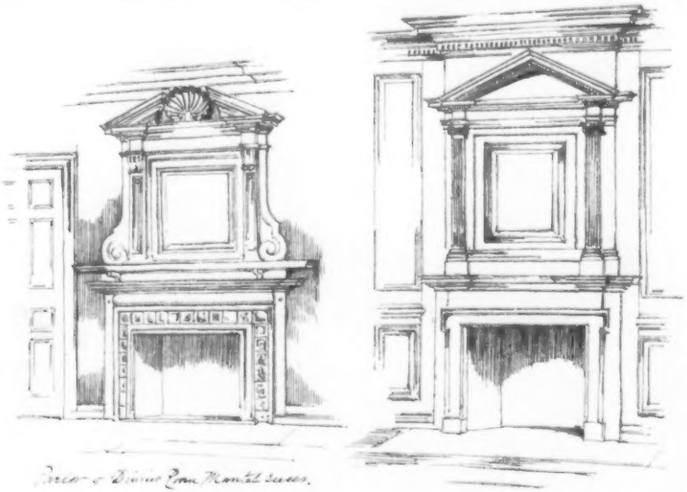
The Front on S. Main St.



Decor. & Details from Mantel in Parlor.

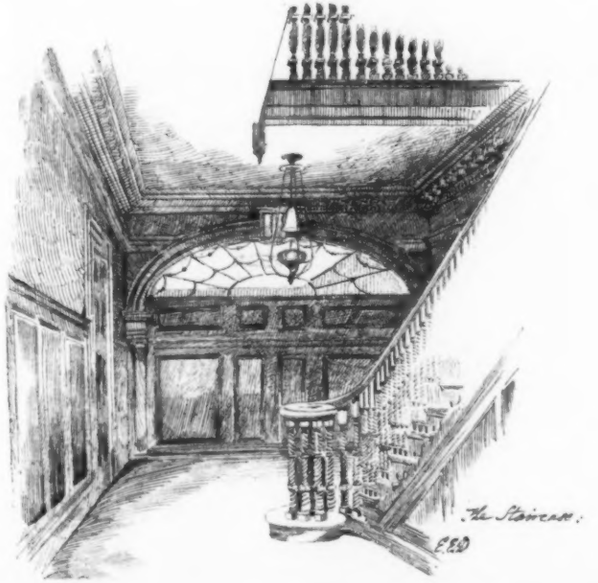
The old Notable Looking towards Stairway

Original Front

The old Providence Bank Building

South Main St Providence R.I.

originally built as a private Residence.



The Staircase.

Heliotype Printing Co. Boston.

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The · Pratt · Institute ·
BROOKLYN N. Y.
Lamb and Rich ..... Architects

Heliotype Printing Co. Boston.

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Heliotype Printing Co. Boston.

Hotel de Ville, Amboise, France.

but with a mottled surface; it is much used for mantelpieces and monuments.

At Pittsford there are three beds or veins of marble which run through the town north and south. The east bed is of the same character as Sutherland Falls marble, of which bed it is probably a continuation; the middle bed is separated from the easterly one by about 200 feet of limestone rock. This bed is about 400 feet wide, and contains marble of all shades, ranging from white to dark blue. Marble from the Pittsford quarries has been used in the construction of several large buildings at Boston — notably, the Continental Building, Commonwealth Hotel, and the Blackstone National Bank Building.

About a mile to the south of Pittsford some marble is quarried known as "Florence marble." It is dark-blue in color, mottled, and veined. The quarries were first opened in 1880, and the production rapidly assumed large proportions. In 1884 it was calculated that the output was nearly 10,000 tons.

Another dark, dove-colored marble is found at Brandon. Several quarries have been opened near this town, but only one is now in active operation.

At Middlebury there are extensive deposits of white marble, which some years ago were very largely worked. Little in this way has been done of late, as the marble, although of good color, has proved to be so generally unsound that the working of it has not been remunerative.

The first attempt to manufacture marble upon a large scale which was made in the States originated in Middlebury. In a history of this town, by Judge Swift, there is an interesting quotation from a pamphlet written by Professor Frederick Hall, and published as long ago as 1821, which is as follows:

"Proceeding down the creek on the western side, after passing two saw-mills, two grist-mills, a clothier's works, and some other establishments of minor importance, you come to a marble factory. The marble of this village, which is now wrought on a large scale, and is extensively approved over the country, was discovered by Eben W. Judd, the present proprietor, as early as 1802. A building on a limited plan was erected, and machinery for sawing the marble was thus put in operation. In 1806 a new and commodious building, two stories high, and destined to comprise 60 saws, to be moved by water, was erected. In 1808 this enlarged establishment went into operation, and has continued to the present day.

"The saws are made of soft iron without teeth, and are similar in form to those which are used for sawing marble by hand in the large cities in Europe. The marble, until lately, has been obtained chiefly from a quarry situated within a few feet of the mill. It is raised from its bed partly by means of wedges, but principally by blasting. The marble, after being sawed into slabs, is manufactured into tombstones, curriers' tables, panels, mantelpieces, hearths, window and door caps and sills, sideboards, sinks, and various other kinds of furniture. These articles are transported to Montreal, Quebec, Boston, New York, and even Georgia. The machinery has sawn annually from five to ten thousand feet since the year 1808."

At Lanabee's Point, in Shoreham, Addison County, there are deposits of black marble which closely approach Kilkenny marble in appearance. The quarries are not now in active operation, but several polished chimneypieces made of it are to be found in some of the older houses in the neighborhood. At one time it appears to have been in much favor.

La Motte marble is another black marble of similar character, but more fossilized. It is found near the west shore of the Island of La Motte in Lake Champlain. It is in considerable demand for the making of flooring-tiles, and finds some employment for monumental purposes.

At Swanton, in Franklin County, there is found a dove-colored marble, which was much used for gravestones down to the year 1850. In that year the workings were abandoned, as the quarries could not compete with those opened at Rutland.

South of Rutland the celebrated Dorset marbles are found. These are situated near the town of that name in Bennington County, Vermont, and are, for the most part, worked in the sides of Dorset Mountain, or Mount Eolus. This is a mountain of marble with a cap of slate on the top. The slate is estimated to be 498 feet in thickness, and the limestone and marble 1,970 feet. Some 200 feet below the slate, white marble used for building purposes is quarried, and 400 feet lower a fine-grained white marble is found which is in great request for monumental purposes. The first quarry was opened in 1785, and saw-mills were erected in South Dorset in 1818.

Before that date the stone was taken from the top or outer edge of the layers, where the strata could be readily split into flags of a thickness of some four or five inches. These flags were then worked up into the required shape with mallet and chisel. When once sawing-plant was in full swing, the harder layers of stone were worked, and the sawn marble found a ready market. In 1840, before the introduction of Italian and Rutland marble, the demand for Dorset marble was beyond the supply.

What is known as Vermont Italian marble is worked up the mountain at East Dorset. This marble is almost exclusively used for monumental and decorative purposes. The production reaches an annual average of over 30,000 cubic feet.

A quarry known as the Freedley Quarry, situated a little farther to the north, has been worked since 1820, and is still producing a white marble much used for building purposes. The quarry is high up in the mountain, and the blocks are sent down by means of an inclined railroad. The annual production of the Freedley quarry averages 40,000 cubic feet.

PRIX DE RECONNAISSANCE DES ARCHITECTES AMÉRICAINS.

April 24, 1886.

Dear Sir, — It is proposed that those architects who, during the last forty years, have pursued their professional studies in Paris, whether as students at the École des Beaux-Arts itself, or as students in the *ateliers* attached to it, shall signify their sense of the obligations under which they stand to the Government and people of France by uniting to establish in the school a perpetual benefaction, to be enjoyed by Frenchmen only, under the name of the Prix de Reconnaissance des Architects Américains, and the undersigned have formed themselves into a Committee to further this scheme and carry it into execution.

The books of the École des Beaux-Arts contain the names of forty-six Americans who have been received into the school in the section of architecture, and have enjoyed free of cost all the rights and privileges established by the Government for the benefit of its own citizens, with the single exception that the Grand Prix de Rome is not open to them. But they have been admitted to compete for other prizes, seven founded in the school itself and five in the Académie des Beaux-Arts, with an aggregate annual value of more than fifteen thousand francs, besides having access to the lectures, the library and the collections.

An equal number of American students have been admitted to the different public and private *ateliers* who, without entering the school, have profited by the generosity with which it is administered, and have been inspired by the atmosphere it has created.

It seems time that something were done, not to requite these benefits, for that would be impossible, but to show that we are not ungrateful for them. Whatever is done should be done without ostentation, but it should be done handsomely and upon a scale befitting a public recognition of benefits publicly bestowed. A subscription of fifty or a hundred dollars apiece from such of us as can afford it, with larger sums from the more prosperous, and such aid from other persons as they may be disposed to offer, seems to be a proper basis on which to proceed. This would bring in from five to ten thousand dollars, according to the cordiality of the response. Less than the smaller sum would not be adequate to the occasion; more than the larger is not to be specially desired. This is about the range of the foundations already existing in the school.

The international character of the enterprise is calculated to give it interest and importance in the eyes of the public, and several persons not connected with the school, or even with the profession, to whom a knowledge of the scheme has been confided, have spontaneously expressed a wish to be allowed to contribute to the fund. It may well happen that some of the past students of the school who most eagerly sympathize with the undertaking, but cannot from their own means make the subscriptions they would wish, may be able, by interesting some of their friends or clients in the work, to more than make good the deficiency of their own contributions.

Subscriptions may be made either in a single sum or by quarterly instalments, to begin on the 1st of June. No subscription will be called for until the success of the undertaking is assured. Answers to this circular may be sent either to the Secretary, or to any of the undersigned.

Until success is fully assured it is obviously undesirable that anything should be said about the undertaking in public. You will please consider this accordingly as a personal and confidential communication, and will use all possible precautions to prevent any mention of it in newspapers or periodicals.

The list of names and addresses herewith enclosed is necessarily imperfect and erroneous in many particulars. Will you kindly forward to the Secretary any information in your possession which will render it more complete.

In case their endeavors are successful, of which they are not willing to entertain a doubt, the undersigned will take the responsibility of entering into communication with the authorities of the École des Beaux-Arts, with a view to arranging the statutes regulating the bestowal of the prize so as to conform to their usages. A report of this action and of its results will be sent to each subscriber.

Richard M. Hunt	New York, N. Y.
Alfred H. Thorp	New York, N. Y.
Charles F. McKim	New York, N. Y.
Henry O. Avery	New York, N. Y.
Thomas Hastings	New York, N. Y.
Henry H. Richardson	Brookline, Mass.
Robert S. Peabody	Boston, Mass.
Arthur Rotch	Boston, Mass.
William Rotch Ware	Boston, Mass.
William E. Chamberlin	Boston, Mass.
Harrison W. Lindsley	Connecticut.
Theophilus P. Chandler, Jr.	Philadelphia, Pa.
John Stewardson	Philadelphia, Pa.
J. B. Noel Wyatt	Baltimore, Md.
J. C. Hornblower	Washington, D.C.
Edward A. Kent	Buffalo, N. Y.
Louis H. Sullivan	Chicago, Ill.

George L. Healy	Chicago, Ill.
John M. Donaldson	Detroit, Mich.
Albert Pissis	California.
G. T. Snelling	Paris.
Richard H. Hunt	Paris.

Whitney Warren, - - Newport, R. I., *Secretary*.

PRIX DE RECONNAISSANCE DES ARCHITECTES AMÉRICAINS.
AUXILIARY SUBSCRIPTION.

East Forty-Ninth Street, New York.

Dear Sir, — We enclose, by permission, a circular which has lately been sent to all the architects in the country who have pursued their professional studies in the *ateliers* attached to the School of Fine Arts in Paris. It proposes that they shall show their sense of the obligations under which the school has placed them by establishing in it a prize to be called the Prix de Reconnaissance des Architectes Américains, as a permanent expression of their gratitude to the Government and people of France.

It appears that a fund of ten thousand dollars is needed to do this as it ought to be done, for if done at all, it should be done handsomely. The chief part of this sum it will probably not be difficult to obtain from the men, nearly a hundred in number, who have studied in Paris, and whose names are to be found upon the list which follows the circular. But there are four or five times as many who are, like ourselves, the pupils of these *Elèves*, belonging, so to speak, to the second generation, who also recognize the École des Beaux-Arts as the ultimate source of much that it has most profited them to receive, and who may properly ask to share in this acknowledgment. For our own part we are not willing that it should go forward without our coöperation, and believing that many of our fellow-students will feel as we do about it, we invite you to unite with us in making up an auxiliary subscription, supplementary to the other, which shall put the success of the undertaking beyond a peradventure, and make sure that the gift shall be worthy of the occasion.

Subscriptions of five or ten dollars each, with fifty or a hundred from such of us as can afford it, would make up a sum which, though not very large in itself, would add greatly to the significance as well as to the amount of the fund. Indeed, nothing could so much enhance the value of the undertaking, regarded as an act of international courtesy, as that it should be promoted by numbers of students in every part of the Union, who are personally strangers to the school.

Please bring this to the attention of any persons who are likely to take an active interest in the undertaking, but as a premature publicity is obviously not to be desired, please consider it as a personal and confidential communication, and use every endeavor to prevent mention of it in newspapers or periodicals.

A report of what has been accomplished will be sent to each subscriber.

William R. Ware, *Secretary*, School of Mines,
and others.

New York, August 19, 1887.

Dear Sir, — A joint meeting of the Committee and of the Auxiliary Committee was held at Mr. Hunt's office, in this city, on Saturday the 5th of March.

The Treasurer, Mr. H. O. Avery, reported that out of the ninety-one men who were named upon the circular sent out a year ago as having studied architecture in Paris, either at the École or in some of the *ateliers* attached to it, five had died, two had sent word that their names had been included in the list by mistake, and there were seven whose address had not been ascertained. Nineteen others had not yet subscribed to the fund, though some of them had expressed the intention to do so. From the remaining fifty-eight about thirty-five hundred dollars had been received in sums varying from five to two hundred and fifty dollars.

The auxiliary subscription, organized by the pupils of the men who had been in Paris, had amounted to about seven hundred dollars in sums ranging from five dollars to a hundred. Here also some persons who had signified their intention of adding to the fund had not yet done so.

To these sums a number of persons, both in the profession and out of it, had added about twenty-five hundred dollars in sums varying from twenty-five dollars to two hundred and fifty. This they had given out of sympathy with the undertaking and from a desire to take part in a notable act of international courtesy.

The question before the Joint Committee was whether to close the subscription and send the seven thousand dollars at once to Paris. This would obviously leave the amount of the fund at a smaller figure than was desirable, and would deprive some persons of an opportunity to take part in the enterprise who had expressed a wish to do so. On the other hand, though the matter had so far been kept out of the newspapers, they might publish it at any moment, and there was danger that a knowledge of the scheme might thus prematurely reach the other side of the water. It was finally resolved to keep the subscription still open, but to ask Mr. Hunt, as Chairman of the Joint Committee, to put himself in communication with the authorities of the École des Beaux-Arts, informing them of what had been done and asking their acceptance of the gift.

This he at once proceeded to do, employing as his messenger his son, Mr. R. H. Hunt, a member of the committee, now a student in the school. In reply he has received the two letters which follow.

The first is from the Director of the School, to whom his letter was addressed. The second is a more formal acknowledgment from the Minister of Public Instruction and of the Fine Arts.

Paris, le 21 Mars, 1887.

Monsieur le Président :

Vous avez pris soin de m'adresser, au nom des architectes des Etats-Unis, un chèque de trente-cinq mille francs dont l'intérêt constituerait, pour les élèves architectes français, un prix annuel qui serait intitulé : "*Le prix de reconnaissance des architectes américains*," Je suis très touché de votre généreuse pensée et vous prie de vouloir bien agréer pour vous et vos compatriotes l'expression de notre vive gratitude. J'écris aujourd'hui même à Monsieur le Directeur des Beaux-Arts pour lui demander, suivant nos règlements, l'autorisation d'accepter cette importante donation. Veuillez agréer, Monsieur le Président, l'assurance de mes sentiments les plus distingués.

Le Directeur de l'Ecole des Beaux-Arts, Membre de l'Institut.

P. DUBOIS.

Palais-Royal, le 7 Avril 1887.

Monsieur :

Monsieur le Directeur de l'Ecole Nationale des Beaux-Arts m'a transmis la lettre que vous avez bien voulu lui écrire pour lui annonçer qu'un certain nombre de vos compatriotes, pour la plupart anciens élèves de cet établissement, ont souscrit une somme de trente-cinq mille francs destinée à la fondation d'un prix annuel auquel ils désirent donner le titre de "*Prix de reconnaissance des architectes américains*," à décerner aux élèves français.

J'ai l'honneur de vous faire savoir, Monsieur, que j'accepte avec empressement cette donation, en attendant que, conformément aux lois en vigueur, elle soit définitivement acceptée par Décret du Président de la République rendu en Conseil d'Etat. Je vous prie, en même temps, de vouloir bien être auprès de Messieurs les souscripteurs l'interprète de mes plus vifs remerciments et de ma sincère gratitude pour cette marque généreuse de sympathie donnée aux élèves de notre École Nationale des Beaux-Arts, qui garderont de leurs camarades américains un précieux et durable souvenir.

Agréez, Monsieur, l'assurance de ma considération la plus distinguée.

Le Ministre de l'Instruction publique et des Beaux-Arts,

BERTHELOT.

Moreover, in the annual report of Mr. Paul Wallon, Secretary of the Société Centrale des Architectes, read at the École des Beaux-Arts on the 10th of June, occurs the following passage : —

"Notre école donne sans compter, elle accueille sans distinction d'origine ni de nationalités tous ceux qui viennent à elle ; toutes les parties du monde sont ses tributaires.

"Cette générosité lui a valu de nos confrères américains un témoignage tout récent de gratitude. Par l'entremise de leur président, M. Richard M. Hunt, — membre libre de notre Société, — les architectes des Etats-Unis viennent de fonder un prix annuel qu'ils demandent d'intituler : *Prix de reconnaissance des architectes américains.*

"La lettre qui accompagne cette donation est rédigée dans les termes les plus flatteurs, les plus touchants, spécifiant que les donateurs désirent fonder ce prix, en faveur des élèves français *seuls*, pour mieux accentuer leur gratitude envers la France.

"Ce sont là, pour notre France, de précieuses et douces paroles qui consolent de bien des injures, de bien des injustices."

It will be seen that the offer of this gift has been received with the greatest satisfaction, though its official acceptance must await the completion of certain formalities. Meanwhile it is hoped that at least another thousand dollars may be added to the fund. Several hundred have been received since the March meeting.

A complete list of all the subscribers will finally be transmitted to Paris.

Yours truly, WILLIAM R. WARE,
Secretary of the Joint Committee.

PRESENT LIST OF SUBSCRIBERS.

STUDENTS ADMITTED INTO THE ECOLE DES BEAUX-ARTS.

1846	Richard M. Hunt.
1863	Edward D. Lindsey.
1864	Alfred H. Thorp.
1868	Robert S. Peabody.
	Charles F. McKim.
	Sidney V. Stratton.
1872	J. Rogers Rich.
1873	William B. Bigelow.
	Albert Pissis.
1874	George R. Shaw.
	Arthur Rotch.
	Walter Cook.
	Louis H. Sullivan.
	Henry O. Avery.
1875	Henry A. Phillips.
	William Rotch Ware.
1876	Lindley Johnson.
1877	Henry D. Hunnewell.
1878	Clarence H. Blackall.
	William M. Whidden.
	Charles I. Berg.
1879	William E. Chamberlin.
	Edmund R. Willson.
	William A. Otis.
	A. D. F. Hamlin.
1880	Alex. W. Longfellow, Jr.
	Thomas Hastings.
	John M. Carrère, Jr.
1881	John Stewardson.
1882	Bernard R. Maybeck.
1883	Arthur L. Tuckerman.
1884	Frank C. Huidekoper.
1885	Grenville T. Snelling.
	Richard H. Hunt.

STUDENTS IN THE ATELIERS.

1860	Maurice Fornachon.
1861	William G. Preston.
1864	Edmund Quincy, Jr.
	John A. Mitchell.
	W. T. Winslow.
1867	Francis W. Chandler.
1868	John P. Putnam.
	George T. Tilden.
1869	Theo. P. Chandler, Jr.
1873	Robert G. Shaw.
	J. B. Noel Wyatt.
1874	Henry P. Clark.
	Edgar C. Curtis.
1875	Edward H. Greenleaf.
	Edward S. Thacher.
	Warren R. Briggs.
	J. C. Hornblower.
1876	John M. Donaldson.
	George H. Wethereil.
1877	W. B. S. Clymer.
	Edward A. Kent.
1880	Alexander I. Finkle.
1885	Whitney Warren.
	Charles B. Perkins.
1886	Samuel W. Mead.
	George Cary.

PUPILS OF STUDENTS AT THE ECOLE AND IN THE ATELIERS.

1859 George B. Post.
Henry Van Brunt.
Wm. R. Ware.
1868 Theodore M. Clark.
1870 Stanford White.
1875 A. J. Boyden.
William B. Tuthill.
1876 M. J. Brown.
Robert D. Andrews.
Arthur G. Everett.
1877 Pierce P. Furber.
Herbert Jaques.
E. M. Wheelwright.
1878 F. E. Zerrahn.
1879 William A. Aiken.
Francis H. Bacon.
H. L. Warren.
1880 Henry I. Cobb.
Cass Gilbert.
1881 C. A. Coolidge.
C. A. Gifford.
Charles A. Rich.
William C. Richardson.
George F. Shepley.
D. W. Willard.
1882 Edward T. Newton.
J. S. Rogers, Jr.
1883 Edward F. Ely.
1884 William D. Austin.
1885 W. C. Noland.
1886 Joseph E. Chandler.
Henry B. Shope.
1887 William A. Boring.
Edward P. Casey.
John T. Walker, Jr.

Pupils of Mr. Hunt, Mr. Richardson, and others.

1868 Frederick Brooks.
Stephen C. Earle.
1869 George A. Avery.
1870 G. Wilton Lewis.
1871 L. H. Gibson.
1872 Francis Skinner.
J. A. Wilson.
1873 Glenn Brown.
W. H. Dabney, Jr.
Bernard Vonnegut.
1875 R. D. Chapell.
1876 H. S. Josselyn.
E. H. Taylor.
1877 A. W. Brunner.
1878 Frank H. Beebe.
Silas R. Burns.
Arthur B. Cram.
Clarence H. Johnston.
Thomas O'Grady, Jr.
William Zimmerman.
1879 George L. Heins.
William Kauffman.
1884 Lyman Farwell.
Joseph B. Gay.
George C. Harding.
1885 Henry D. Bates.
Henry F. Bigelow.
William W. Bosworth.
Simon B. Eisendrath.
Edwards J. Gale.
Thomas R. Kimball.
Frank B. Meade.
1885 Wilson B. Parker.
Dwight H. Perkins.
William Proctor, Jr.
Annie G. Rockfellow.
George C. Shattuck.
Murray Smith.
George W. Stone.
Everett K. Taylor.
Frederick S. Taylor.
1886 William S. Aldrich.
John W. Bemis.
E. Earle Calkins.
John W. Case.
A. W. Cobb.
Charles H. Converse.
Charles W. Dawson.
H. C. Dittrich.
Charles R. Edgerton.
Arthur V. Edwards.
J. Edward Fuller, Jr.
David P. Goodrich.
Irving T. Guild.
Joseph J. Hall.
Adolph Hallenberg.
Howard G. Hodgkins.
Richard Hooker.
George C. Kaufman.
Daniel D. Kearns.
Walter H. Kilham.
A. W. LaRose.
Charles R. LaRose.
Frank H. Martin.
Frank L. Packard.
Herman Parker.
Charles B. Pitman.
Theodore W. Pietsch.
William G. Plumer.
John H. Rankin.
Clary E. Ray.
Robert R. Snow.
Herman W. Tamkin.
Paul H. Tracy.
Oliver F. Wadsworth, Jr.
George C. Wales.

Pupils of Mr. Chandler and Mr. Letang, at the Massachusetts Institute of Technology.

1881 Willard P. Little.
Alvan C. Nye.
1882 Thomas Nolan.
M. J. O'Connor.
1883 S. B. P. Trowbridge.
1884 Stockton B. Colt.
Harry E. Donnell.
John A. O'Connor.
Edward C. Robinson.
1885 John S. Appleby.
Charles A. Bechstein.
A. R. McIlvane.
O. L. I. Rogers.
Arthur A. Stoughton.
Allen Tucker.
1886 Charles T. Mathews.
Samuel T. Skidmore.
1887 A. M. Hadden.
William S. Post.

Pupils of Mr. Hamlin, at the School of Mines, Columbia College.

FRIENDS AND OTHER ARCHITECTS.

Edward D. Adams.
Hicks Arnold.
Samuel P. Avery.
John C. Bancroft.
Martin Brimmer.
Daniel H. Burnham.
F. D. Carley.
Walter Cope.
H. C. Fahnestock.
Robert Goelet.
Edward H. Kendall.
Charles Lanier.
H. G. Marquand.
Henry C. Meyer.
Levi P. Morton.
Mrs. E. T. Potter.
Leoni W. Robinson.
John W. Root.
John H. Sturgis.
Russell Sturgis.
Charles S. Smith.
James F. Sutton.
J. J. Van Alan.
Cornelius Vanderbilt.
Wm. K. Vanderbilt.
George W. Vanderbilt.
C. Howard Walker.
Harry Walters.
Wm. T. Walters.
Mrs. George H. Warren.
Theodore Weston.
George P. Wetmore.
Mrs. Henry Whitman.

SOCIETIES

THIRD EXHIBITION OF THE ARCHITECTURAL LEAGUE.

152 FIFTH AVENUE, August 1, 1887.

THE Third Annual Exhibition at the Fifth Avenue Art Galleries, 366 and 368 Fifth Avenue, adjoining the Stewart Mansion, New York City, will be open to the public on Monday, December 19, 1887, and will continue for three weeks. The exhibition will consist of work not before exhibited in New York City, and representing, as far as practicable, the work of the past year.

CONDITIONS.

The exhibition shall be devoted to architecture and the allied arts, as may be represented as follows: Architectural designs; perspective drawings; sketches in pencil, pen-and-ink, water-colors, charcoal, etc.; elevations and photographs of executed work; sketches for interior decoration and furniture; designs and cartoons for stained glass; mural decoration and paintings of foreign work.

EXECUTED WORK.

Stained glass; wood carving; mosaic, and casts and models of executed architectural and decorative work.

A detailed circular of blanks as to jury, framing, transportation, etc., is now being prepared, and can be had after October 1st, on application to the Secretary.

By order of the Executive Committee.

CHARLES I. BERG, *Secretary.*

COMMUNICATIONS

THE INDIANA SOLDIERS' AND SAILORS' MONUMENT.

INDIANAPOLIS, IND., August 24, 1887.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Our Commission is building the Indiana Soldiers' and Sailors' Monument, not the Indianapolis Soldiers' Monument, as you have it in your last issue. The State is furnishing the money, and should have the credit.

Yours respectfully. GEO. W. JOHNSTON.

INDIANAPOLIS, IND., August 25, 1887.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—To state a fact, and to correct a misstatement or mistake of your correspondent who wrote from this city on August 10, over the signature of "Monument," will you please state that the name of Professor W. R. Ware, who has been selected as one of the experts and professional advisers of this Commission, was not first proposed to the Commission by "Monument," as he states, nor by any architect nor by any one who will be a competitor in the competition to furnish a design or for the work. Several persons having publicly claimed to have been the first to suggest the name of the first expert selected, it seems necessary to disabuse their minds and those of any who may contemplate entering the competition. Professor Ware's name having been for some time under consideration by this Board, it was practically decided on before the receipt of the many requests coming almost simultaneously from architects, asking that he be appointed, when it became known that the Board was canvassing the matter of the appointment of experts. No architect or prospective competitor either primarily suggested or influenced the selection of either one of the experts.

I enclose you, herewith, a proof of the text of the instructions, etc. As soon as actually ready I will send you a copy containing the phototypes, etc. Please accept our thanks for printing my letter of the 8th, and for the friendly feeling you manifest toward the enterprise.

Very respectfully, etc., J. F. GOOKINS,
Sec'y S. S. & S. M. Com.

RECTOR PIERSON'S GRAVE.

EVERGREEN HOME, ONARGA, ILL., August 19, 1887.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Your correspondent, Mr. T. H. Bartlett, has appealed to me in a communication in the *American Architect* of August 6, 1887, in the following language; to wit, "Having kindly set me right in regard to the grave-stone of one of the sons of the Rector, and stated the interesting fact that many hundreds of his male descendants are living, will Mr. Pierson please state where the ashes of his ancestor do repose, and whether there is any stone to mark the place? Thus enabling me to complete a full statement concerning an important point, the last resting-place of the first President of Yale."

As a preliminary to my reply, I would here state that the base-stones and plinth of the column monument to the memory of Rector Pierson, on Meeting-House Hill in Clinton, Conn., of which there is a representation on page 268 of the *American Architect* of June 4th, were put in place with the view of ultimately crowning them with a sun-dial. With this purpose, this structure was unveiled and dedicated June 7, 1868, though other views finally prevailed in regard to the superstructure. The historian of the occasion states that:

"This monument is the contribution of several gentlemen connected with Yale College and with the New Haven Colony Historical Society, and is the first of a series of fixed land-marks designed to be set up throughout the State in commemoration of important events in our history."

On this occasion large numbers of citizens were present from New

Haven, Clinton, Killingworth, and other towns: Dr. Daggett, President Woolsey, Dr. Bacon, General Wm. S. Pierson, Governor Dutton, and numerous other notable persons read appropriate addresses.

At the conclusion of these exercises on Meeting-House Hill, the narrative runs:

"A procession of the people was formed, headed by Governor Dutton, to visit the graves of *Pierson* and Elliot, *in the old cemetery behind the church.*

"The graves of these worthies were hung with bouquets and wreaths of flowers, fragrant and beautiful. After a look at the old gravestones, and a fruitless attempt to decipher the inscriptions, a benediction was pronounced at the grave of Rector Pierson, by the Rev. Dr. Arms, of Norwich, and the people dispersed.

"The grave of the Rector — a good and learned man — was a fitting spot where to close the ceremonies that commemorated one of the most notable events in the early history of our College, which, from so small a beginning, has grown to be the first institution of learning in the republic."

I would here add to this narrative that the inscription on the grave-stone erected over the grave of Rector Pierson, and which the visitors on this interesting occasion did not succeed in deciphering, reads as follows:

"In memory of ye Rev. Mr. Abraham Pierson, first President of ye College in Connecticut, who deceased March ye 5th, 1706–7."

Such is the information, and all the information, that I have been able to gather in relation to the resting-place of the remains of the first President of Yale College. There is undoubtedly "*a stone to mark the place*," but the inference is that a minute description of it, were I able to furnish one, would hardly interest the artistic readers of the *American Architect*.

Your respected correspondent, Mr. Bartlett, says in the *American Architect* of August 6, page 67, that "my statement [in a previous number] that General Wm. S. Pierson, of Windsor, Conn., was 'the only living male descendant of Rector Pierson, the first President of Yale,' was made to me by the General himself in 1872."

Now there is a strong presumption that your correspondent misunderstood General Pierson in the conversation here referred to. This presumption is based upon the following facts and circumstances:

[Our correspondent goes into the genealogical history of the descendants of Rector Pierson at some length, and closes as follows:]

The writer has personally met many of the descendants of Rector Pierson, in several States of the Union, and he has read and heard of many others.

I think I have said enough, without going into further details in which your readers could feel no interest, to raise a strong presumption that the descendants of Rector Pierson number not only many hundreds, but some thousands; and the probability is that about one-half of them are men, or, in the language of your correspondent, "male descendants."

But I am fortunate in having a word from the General himself, that goes far to show conclusively that he set up no exclusive claim to the sole heirship from the Rector, of the Pierson name, and that your correspondent must have misunderstood him. It will be noted that the conversation with the General in which this remarkable claim is said to have been made, occurred in 1872. Some years before his death, General Pierson sent me a pamphlet containing the address that he delivered in 1868 on the occasion above referred to, of the notable gathering on Meeting-House Hill for the purpose of dedicating the Pierson monument. Near the close of that address, the General said:

"I remember to have seen Deacon Abraham Pierson in my childhood, etc. . . . My honored father, the late Dr. Wm. S. Pierson, was the son of Deacon Abraham. He was a graduate of Yale, etc. . . . If time would permit, I would speak of *some* of the *descendants* of the *old Rector, in other lines than that of my own family, especially as there are representatives of other families present.*"

It should be observed here that this address was delivered on Meeting-House Hill, June 17, 1868, while the conversation above referred to, occurred in 1872, more than four years subsequent. It is hardly presumable that what the General knew about "*the descendants of the old Rector, in other lines than that of his own family*, in 1868, had been entirely forgotten, or was ignored, in 1872."

All the facts and circumstances in the case having been carefully considered, it is pretty evident, I think, that your correspondent's report of the conversation between himself and General Pierson in 1872, does the General serious, though undoubtedly unintentional, injustice. Very truly yours, Wm. P. Pierson.

NOTES AND CLIPPINGS

Recent Excavations. — The necropolis of the ancient city of Carmona has just been discovered about half a mile beyond the Arab gate of Seville. The inhabitants of Carmona were the most civilized of the Iberian Peninsula several centuries before the Christian era, and it is said that their laws were written in verse. The excavations which have recently been made have resulted in the discovery of a large number of coins, and between the two fields known as the Quarries and the Olive Groves the excavations have brought to light a great many sepulchral chambers, hewn out of the rock, with funeral urns in the sides. The roofs of these sepulchral chambers are some of them vaulted, while others are flat. There are several furnaces either inside or just outside the chambers, and it was in these that the incineration took place, the ashes being placed in black earthenware urns. Among the other objects found was a mirror with a handle, a lamp, a lachrymary, a bronze statue, several pieces of iron, libation cups, nuts, the remains of a repast, and some pipes communicating with the inside and the outside of the sepulchral chambers. — *New York Evening Post.*

TRADE SURVEYS

The month of August has been an exceptionally active and prosperous one, in all of the leading industries. Where large sales and contracts have not been made, inquiries and offers have been received, showing that consumers are ready and anxious to buy as soon as assured that they are safe. An impression has been gaining ground in some quarters, that a reaction in prices is among the immediate probabilities. It is scarcely necessary to discuss or measure the reasons given for this belief. The probabilities all point to strong, if not advancing prices. An advance in prices would, at this time, be a disadvantage to industrial and business interests at large. A temporary decline in prices might do no harm; but might weaken the strong confidence which now exists. Public opinion does not admit the possibility of a permanent advance in any direction; on the contrary, the rapid growth of productive capacity is a reason given why prices, sooner or later, should and must decline. As an illustration of the downward tendency which many declare to exist, it is to be pointed out that steel rails have sold within a few days at $36 at mill. They advanced from $26 to $40 within two years, and have now receded to $36; but a little reaction is already in sight, which will probably permanently land them at $37. The production next year will be in excess of 2,500,000 tons; the demand will be extraordinary. Nearly every mill is straining its capacity. Since the 1st of July, between 3,000 and 4,000 miles of road have been either projected or talked of among capitalists who have the money and determination to build. From all indications, the boom in the iron trade will continue. Much complaint continues to be made day after day, of the heavy foreign importations, and not without some cause. Within the past forty-eight hours, brokers in New York, Philadelphia, and at one or two other points, have received inquiries for material which will aggregate over 100,000 tons. Bessemer pig, rail-blooms, nail-slabs, billets, tin-plate, wire-rods, and even beams are under inquiry, and a heavy demand will very probably set in, regardless of the wishes of American makers. Although foreign beams are three-fourths of a cent lower at tidewater than American beams at mill, the American makers are able to control the trade. The demands from builders for structural iron is fully double what it was a year ago. Bridge-builders are making urgent demands and two or three new works are now projected for rolling shapes; one of them will be located at East Chicago. The pipe-makers have had a remarkably good year, and will meet in a few days to try and advance quotations. The nail-makers of the East met at Philadelphia on Wednesday to lay the basis for an advance, and to take steps to effect a National combination which has been under consideration for some time. The plate and tank iron-makers have been crowded with orders during August, and have more work on hand now than for two or three years. The same is true of bar mills all over the country. The crude-iron industry is in excellent shape and production is increasing. Average tidewater quotations for forge, $17.50. All the other leading industries are gaining strength, and it is possible that in some two or three, winter orders will command better prices. The demand for all kinds of machinery and motive power is exceptionally good. It has been said by persons competent to speak, that three-fifths of all our steam-using establishments are increasing their steam-using facilities. This guess may possibly be wide of the mark; but we are safe in saying in a general way, that a great increase in capacity of all kinds is being made. The lumber manufacturers and dealers, West, East and South, have suffered no obstruction through a clogging condition of markets. Hard woods are much more abundant now than for months; but prices do not seem to recede. Locomotive-builders have had a better August business than for any month for six past. Very late advices from leading car-builders in the West, show that the capacity is not equal to this year's requirements.

The electrical-machinery manufacturers have been crowded with orders for equipments, and machinery of all kinds, especially for Western markets. The supply-houses are short of stock. A great many small municipalities, West and South, are clamorous for motive power and light. The success attending the experiments of introducing electrical-motors, is stimulating demand in many quarters, and the leading electricians in the country are talking of combinations which will very likely result in the establishment of new and larger plants. The textile manufacturers are talking with much more confidence than a month ago. The trade conditions now and then are not different. The fall requirements are more clearly seen, and are fully as heavy as anticipated. A few new mills have been projected since July 1, but there will not be that rush that seemed probable, early in the season. Textile manufacturers have learned by experience, that it is best to make haste slowly, and they are now endeavoring to meet the increasing demands of the market, without going too heavily into plant expansion. The paper-makers have been unable to strengthen prices. In one or two branches, combinations have been of advantage, but the paper-making industry at large, is the victim of an active competition which no trade combination seems able to control. The makers of wood-working machinery, and of tools, as well as the manufacturers of small machinery, are in sight of an immense demand for supplies. Agents who have recently returned from their hunting-grounds, have brought in very heavy orders, and report an abundant demand awaiting future production. It is impossible to find a single industry wherein additional capacity could not be employed. This seemingly extravagant statement will bear a rigid scrutiny. In some localities here and there, dulness exists; but it is due to special and temporary causes. The outflow of money from Eastern financial centres have been so active as to create some apprehensions on the part of lenders. There is no good ground, as has been recently stated, for the fears expressed. The indebtedness of the country at large is relatively lower than it ever has been. What the English term the "outturn" is accomplished more quickly than a few years ago. The improvements in exchange, render business men and manufacturers less dependent upon the circulating medium, than heretofore. There are very few commercial failures, and a more rigid supervision is maintained over money-lending institutions. Speculation is more difficult and dangerous. An increasing production is more easily marketed. Our export trade in crude and finished products, is certainly holding its own, and the fears of overpowering foreign competition which were created a few years ago, are disappearing under the improved agricultural and manufacturing processes which the sharpened wits of Americans put into play.

The American Architect and Building News

ADVERTISERS' TRADE SUPPLEMENT.

No. 63. SATURDAY, SEPTEMBER 3, 1887. VOLUME XXII. No. 610.

THE CLIMAX RAIL.

ARCHITECTS, Builders, Contractors and Carpenters are respectfully requested to read the following testimonial letters, and if further evidence is required that the "Climax Rail" should be used in *every* instance where a sliding door is put in, whether interior or exterior, send to the Manufacturers' Agent, 134 Water Street, New York, who will furnish a working-model:

1100 MAIN ST., KANSAS CITY, MO.

Climax Rail Co., New York City:

Gentlemen, — The "Climax Rail" that I got of you last May comes fully up to expectations; it works nicely and is a good improvement over the old way of hanging sliding doors.

Respectfully yours, Geo. W. Davis.

321 FIFTH AVE., NEW YORK, N. Y.

Climax Rail Co.:

Gentlemen, — In reply to your valued favor of the 8th inst., we wish to say that the "Climax Rail," which you put in our office last year, works smoothly and gives entire satisfaction. We think it to be quite an improvement over the old-fashioned rail system, and shall recommend it for use wherever we find an opportunity of doing so. Yours truly, Edward Leissner.

BALTIMORE, MD.

Gents.,—We have sold the "Climax Door-Rail and Hanger," and have found that they give entire satisfaction in every instance, being much superior to the old style of raised rail formerly used. Most respectfully,

C. J. Stewart & Sons, Builders and Hardware.

The Climax Rail Co.:

Gents.,—Enclosed please find draft for $5 for one set of your sliding-door rails, of which I am much pleased; think it's the "dandy."

Yours, etc., J. C. Béane.

MOBILE, ALA.

Mr. Geo. F. Taylor:

Dear Sir, — Your "Rail" has given entire satisfaction, and, when the opportunity offers, we will most assuredly use it in preference to any other. John P. Enrich & Son,

Contractors and Builders.

363 FULTON ST., BROOKLYN, N. Y.

Climax Rail Co., Geo. F. Taylor, Gen'l Agent:

Dear Sir, — I take great pleasure in saying, in regard to your patent "Rail" (a sample of which is now laid in my residence), that when compared with others it presents many improvements, and so far as my prese t experience goes it exceeds the vast majority of other rails in safety, ease of running, and freedom from annoyances incident to other styles. Yours truly,

I. D. Reynolds.

22 DECATUR ST., CAPE MAY CITY.

Geo. F. Taylor:

Dear Sir, — The rails put on the Cape May Ocean Pier, about one year ago, we have not heard the first word of complaint. The location of the rails is outside and exposed to the elements. We consider them the best we have ever used, and we can heartily recommend them to the public. Respectfully,

Hand & Ware, Contractors and Builders.

METROPOLITAN LIFE INS. CO.

Geo. F. Taylor, General Agent:

Dear Sir, — The "Rail" which you have placed in my residence, for the curved and straight doors to run upon, are in every way satisfactory; I am, therefore, pleased to state that your "Climax Rail" is the best appliance for sliding door I have yet seen.

Yours truly, Joseph F. Knapp, Pres't.

CHATANOOGA, TENN.

Climax Rail Co., 134 Water St., New York City:

Gentlemen, — Please mail me prices and cuts of your "Rail" for sliding doors. I have some doors on which the hangers have proved a failure, and understand that your "Rail" can be put in and serve the same purpose.

Respectfully yours, W. H. Converse.

LEESBURG, FLA.

Geo. F. Taylor:

Dear Sir, — In answer to your inquiry as to how I like the "Climax Rail" I got last April, would say that it was put on a door 8′ x 10′, weighing 300 pounds, and that I am well pleased with it and it comes up fully to my expectations.

Very truly yours, J. C. Love.

779 BROADWAY, COR. WALL ST., BROOKLYN, N.Y.

Geo. F. Taylor:

The "Climax Rail," for sliding doors, put in my office-building, has given perfect satisfaction; it works as well to-day as when put in six months ago. There is no possibility of its getting dislocated, as it is flush with the floor. It is a very good improvement over the old style of rail. Yours truly,

Th. Engelhardt, Architect.

919 OLIVE ST., ST. LOUIS, MO.

Geo. F. Taylor, New York City:

Dear Sir, — Your "Climax Rail" is an admirable invention. I am specifying it in all first-class work. Yours, etc.,

Fred W. Folk, Architect.

8 YORK ST., NEW YORK.

Mr. Geo. F. Taylor, Agent "Climax Rail":

Dear Sir, — We have used a number of your "Climax Rails" for sliding doors and are very much pleased with them. We shall certainly use them in all our houses, wherever we may have control. The heavy rails are especially good.

Yours very truly,

F. & W. E. Bloodgood, Masons and Builders.

75 EAST SANTA CLARA ST., SAN JOSE, CAL.

Geo. F. Taylor, 134 Water Street, New York:

Dear Sir, — The "Climax Rails," sent here by you, were all placed in buildings under our supervision, and in every instance have given perfect satisfaction. Yours truly,

Jacob Lenzen & Son, Architects.

52½ WEST BAY ST., JACKSONVILLE, FLA.

Dear Sir, — I like your "Climax Rail," and will specify it when I have occasion.

Very truly yours, H. B. Beebe, Arch't.

508 WALNUT ST., PHILADELPHIA, PA.

Dear Sir, — I have had the "Climax Rail" in practical use for over seven months, and they have all given entire satisfaction, and have, as yet, required no attention whatever, working admirably, and think it is a valuable appliance for easy running.

Yours truly, S. Huckel, Jr.

15 Y. M. C. A. BUILDING, SYRACUSE, N. Y.

I think your "Rail" every way superior to the old elevated rail. I shall specify your "Rail" whenever possible. Respectfully,

E. M. Buell, Architect.

PRATT AND GREEN STS., BALTIMORE, MD.

Geo. F. Taylor:

Dear Sir, — The "Climax Rail" has proved to be a complete success; any small child can slide them with perfect ease; would not have any other kind as a gift. For information,

G. W. Wellham, care C. Skelby & Sons.

PENN. RAILROAD CO., ALTOONA, PA.

Geo. F. Taylor:

Dear Sir, — I have had your "Climax Rail" in constant use for six months — a heavy oak door, 6 feet wide and weighing fully 250 pounds. It gives me the greatest satisfaction to recommend it. J. B. Bowman.

BRIDGEPORT, CONN.

Climax Rail Co.:

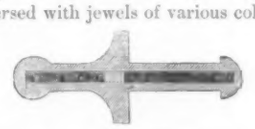
Dear Sir, — We have thoroughly tested your "Climax Rail," for sliding doors, and find it more durable, and easy to adjust and work, than any which has come to our notice. We highly recommend it to builders for general use.

Very truly yours, Downs & Weed.

CLIMAX RAIL COMPANY,
134 WATER ST., NEW YORK CITY.

METALLIC SASHES.

THE elevation shows a portion of two windows; that on the left hand being one-half of a window to the dining-room at the residence, No. 230 West 129th Street; that on the right hand, a modification, in which circles are substituted for angles. This window possesses several novel features beyond that of being constructed with a peculiar sash-bar. The transparent panes are of polished plate-glass, with bevelled edges; the margins and the translucent panes are of tinted opalescent glass, interspersed with jewels of various colors and



forms, cut and uncut. The squares which are placed diagonally, and those pointed at the top, are of cut glass, bevelled, and are ventilators, operated by sliding, as a drawer-front — outward to open, and inward to close, maintaining their ornamental appearance whether open or closed.

The lower portion of the window is glazed with tinted ondoyant glass, is not an opening sash, but is so arranged that, during the summer, it acts as a ventilator to the dining-room, and during the winter, the cold-air supply passes through it to the furnace, and at all times it affords light to the cellar, but has no other connection therewith.

In presenting this design, it is intended to show that, by the facility with which the new sash-bar and reinforced lead bands can be bent

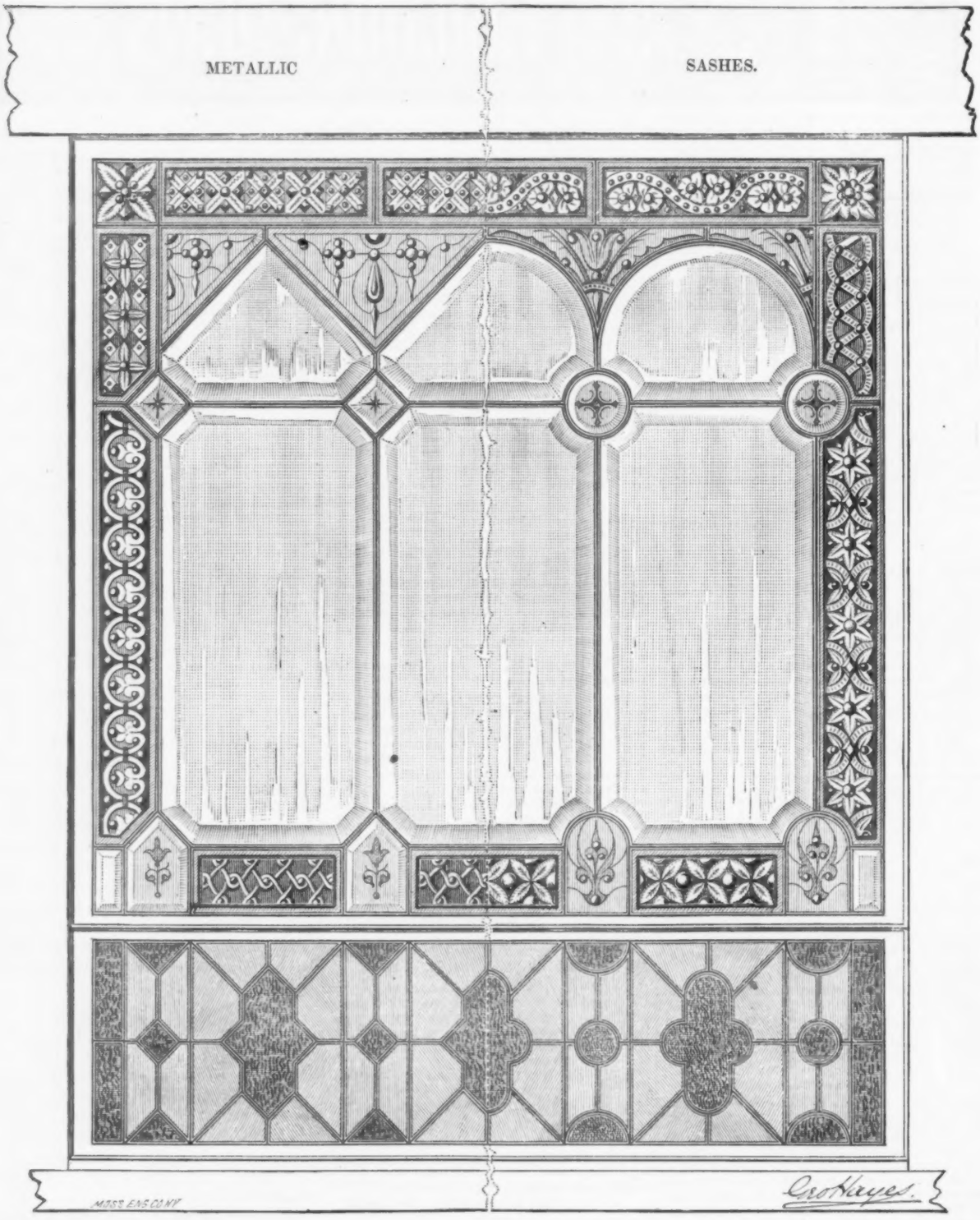
into varied and elaborate forms, embodying more beauty and grace to windows, etc., than has heretofore been accomplished, complete rigidity is attained, the cost is not increased, and the hitherto frail, weak and awkward constructions are superseded, the unsightly, yet essential iron cross-bar, to which leaded work is attached for support, and which so seriously mars the beauty of the design, is filling in the interstices with glass, either opaque, translucent, or transparent, as desired.

In windows for stores, offices, hotels, etc., in lieu of costly single or large panes of plate glass, rendered so by the extra import duties which are imposed, together with other incidental expenses attendant upon large panes, small panes of glass may be substituted with many advantages, among them, less proportionate cost and a more beautiful and attractive appearance.

Windows of dwellings may be gotten up without adhering to the conventional forms of plain squares, and a new departure in architectural effect inaugurated. This is accomplished by the use of our sash-bar, glazed with polished plate-glass, bevelled, and in lieu of the lead bands in present use, our reinforced sash-bars, lead-bands and light-moulded framework is substituted, into which is inserted cast, pressed, cut, ondoyant, opalescent, antique, cathedral and chipped glass, crown discs, jewels, etc.

GEORGE HAYES,
71 Eighth Ave., New York.

Note. — In the absence of illumination and color, it is utterly impossible to even approximate upon paper the beauties of this art, as much so as the portrayal of the beauties of the ruby or diamond.



dispensed with.[1] Mullions which occupy from two to six inches of dead surface in church and other windows, can be replaced by a light sash-bar of about half an inch, and where the design calls for the appearance of heavy columns, or mullions, arches and tracery, it may be carried out by doubling the sash-bars,

[1] Such is the adaptability of this device that an ornamental window-guard of band iron, or even of woven or interlocked wire work, may be taken as a foundation and clothed with the lead form, and be thus transformed into a beautiful and strong sash.

HEALTHY HOMES.

There are none but that desire a healthy home, and to have this it is imperative that they have their surroundings sanitary. The laws of hygiene must be obeyed. The "hole-in-the-ground" plan, or privy pit, is now condemned by all sanitarians as a most dangerous thing — a veritable plague spot — the main cause of typhoid-fever and diphtheria. It is very necessary, if not imperative, that these

privy pits be abolished. We believe it would be for the general good of the community were the dry-earth system and its many advantages better understood. Hundreds and thousands of people in this country suffer inconveniences and annoyances that they would be only too glad to obviate if they knew how. In the absence of sewers or water-works, they take it as a matter of course that they have to resort to the abominable, disease-breeding privy-vault, or cesspool, even at the risk of polluted wells, impure air, and an attack of typhoid, diphtheria, or other preventible disease. Few people know that they can have all the comfort and the convenience of the best water-closet by using earth-closets. We have just issued an illustrated catalogue, 48 pages (5 plans), illustrating our closet, which is very complete, and, we believe, the most perfect on earth-closets ever published. If any of our readers are troubled as to the disposing of their sewage, they should send six cents for a catalogue and a little book, "*Healthy Homes; how to have them*," containing 36 pages of valuable and useful information.

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NOTES.

PROBABLY the largest contract ever made for steam boilers for stationary purposes has recently been awarded by The Edison Electric Illuminating Company, of New York, to the Babcock & Wilcox Company, for 8,700 horse-power of their water-tube boilers, to supply three new central stations now in process of erection in the City of New York. It is expected that with economical engines these boilers will develop an indicated horse-power of not less than 15,000, which is greater than that of the most powerful steamship afloat, the "*Umbria*," which has developed 13,000 indicated horse-power. The awarding of this contract to the Babcock & Wilcox Company is a merited compliment to their system of water-tube steam-boilers, particularly as this is the thirty-fifth order received from the different Edison Companies for boilers for electric-lighting purposes. The Pearl Street Station has been running nearly six years with 900-rated horse-power of the same kind of boilers, which Mr. C. E. Chinnock (one of the Construction Committee of the Edison Company, and who is also the vice-president of the Edison United Mfg. Co.), informs us, have given the most perfect satisfaction, and have cost practically nothing for repairs in that time; that they have been called upon frequently to furnish a capacity fully sixty per cent above their rated power, and they have never failed in any case to respond generously with perfectly dry steam. After six years of such experience as this, joined with experience in a large number of other stations in this country and in Europe, it is no wonder that the preference was given to this boiler for these new stations, which are to be the largest electric lighting stations in the world.

THE Chalmers-Spence Company of New York have just closed a contract with the Southern Cotton-Oil Company for a large quantity of their famous new "C" Asbestos Removable Covering, which is to be placed on all the pipes, boilers and other appliances requiring a non-conducting covering, of their new mills. The contract was placed by Mr. T. K. McKnight, their Pittsburgh agent, after a close contest with other prominent manufacturers.

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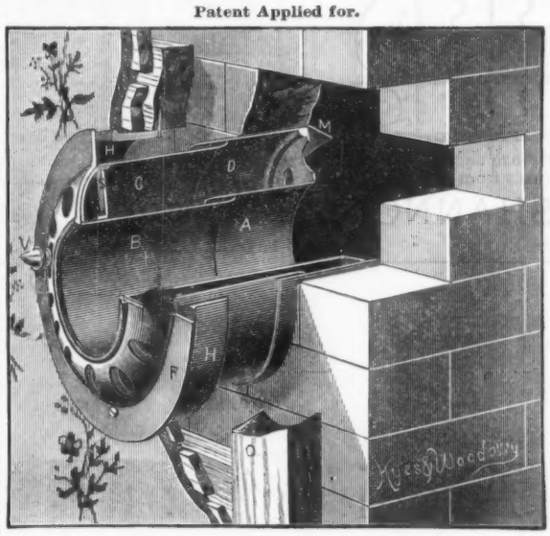

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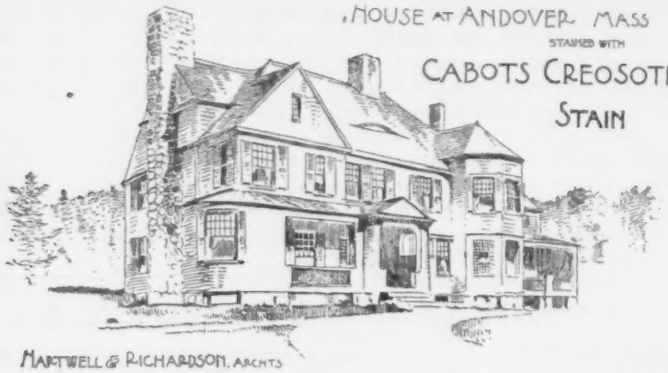

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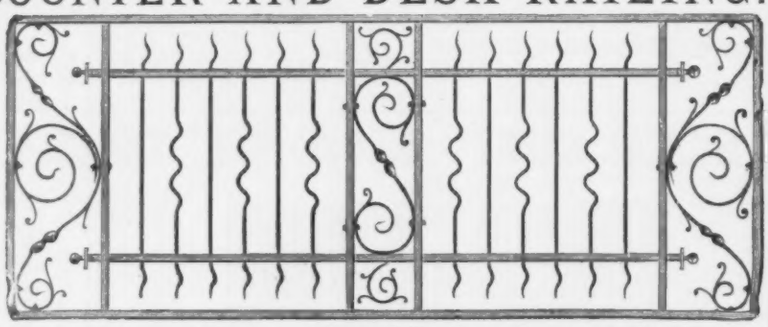

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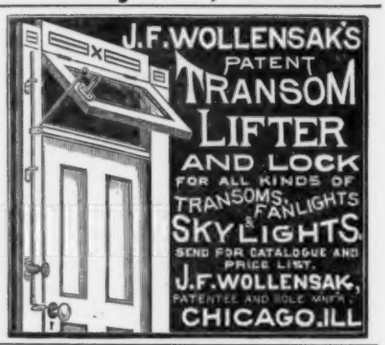

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